FLIGHT

MAGAZINE

MAY 1955

35 cents

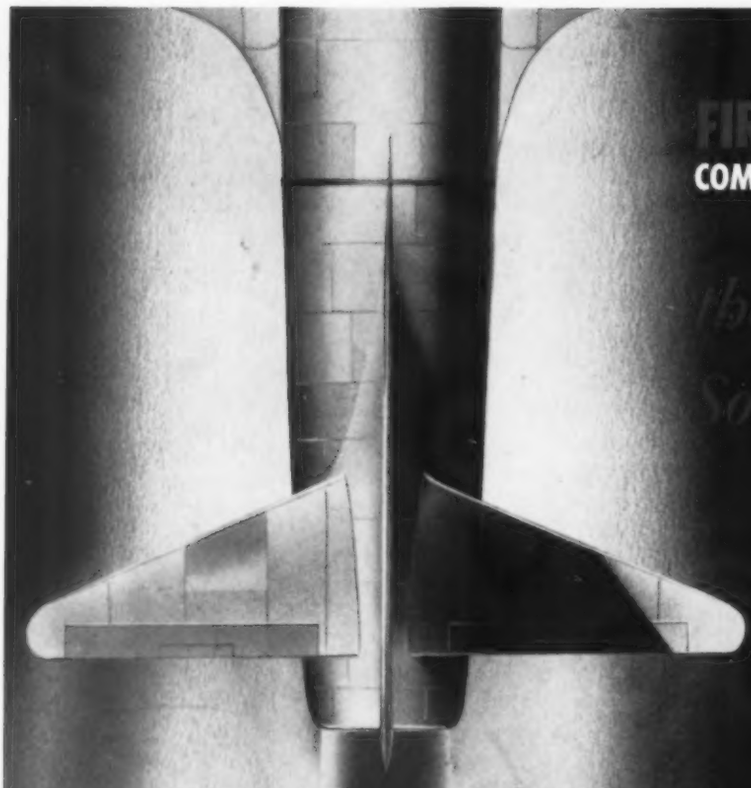
TECHNICAL DEPT.

AIR LIBRARY

MAY 17 1955

BEECH JET FOR BUSINESS FLIERS

(See page 18)



FIRST AMONG THE NATION'S COMMERCIAL OVERHAUL BASES—

The Jet-Age comes to Southwest Airmotive!

First since '32 in numerous service-improvements for the business airplane, Southwest Airmotive is proud now to be FIRST among commercial fixed base operators as a jet engine and accessory overhaul center for the United States Air Force.

We recognize in this historic contract to overhaul Allison J-33-A35 turbo-jet powerplants and their accessories, a deep responsibility to the Air Force and to the American aircraft industry generally.

It is our firm intent to meet this challenge in keeping with our unbroken 23-year record of good faith and top quality craftmanship

Southwest Airmotive COMPANY

LOVE FIELD • DALLAS

IMPORTANT NOTE TO PISTON ENGINE OWNERS:

Southwest Airmotive's Pratt & Whitney Aircraft-Authorized Engine Division will, of course, continue uninterrupted as Hemisphere-Headquarters for the overhaul of conventional piston engines. Workmanship is even finer than before! Write for flat rates and details.

PS: Our "*Moodbeam Misses*" will be back next month

Everything you want...

FOR SAFE, SWIFT, CONVENIENT TRANSPORTATION...

YOU'LL FIND IN THE **Piper Tri-Pacer 150**

SIMPLIFIED CONTROLS coordinate rudder and ailerons automatically, make flying as easy as driving a car. This feature is a Tri-Pacer exclusive in its class.

TRICYCLE LANDING GEAR takes the skill out of landings, improves handling in high winds. It's the modern gear, a Tri-Pacer exclusive in its class.

150 HORSEPOWER Lycoming engine, recognized as one of the finest aircraft engines ever built. Here is your assurance of dependable, economical power.

PIPER DURACLAD construction. Bridge-like fuselage and wing structure are covered with Piper non-flammable Duraclad, tough, durable finish.

QUIET, BEAUTIFUL INTERIOR for travel comfort. You travel in style and comfort in the Tri-Pacer 150 thanks to deep-cushioned seats, excellent sound-proofing and ample warm and cool air systems. Individual front and rear doors plus separate baggage door are exclusive Tri-Pacer features.

Flight-planned instrument panel provides plenty of room for full instruments and radio.

PERFORMANCE PLUS! Now with 150 horsepower, the Tri-Pacer 150 has remarkable short field ability, wonderful rate of climb and cruises 132 mph at optimum altitude of 7000 feet.

You get all this for far less cost than any other production 4-place plane. See and fly the Tri-Pacer 150 at your Piper Dealer's and ask him about the Piper "Learn-as-You-Travel" program or write Piper Aircraft Corporation, Lock Haven, Pennsylvania, Department F-5.

PIPER

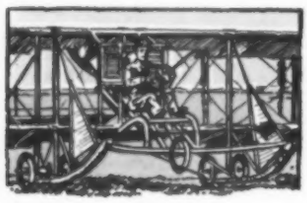
AIRCRAFT CORPORATION

LOCK HAVEN, PENNSYLVANIA

Phillips 66
PRESENTS

MILESTONES IN AVIATION

The Marines Have Landed...



THE *NOISY NAN*

In 1911, a young Marine Corps officer with a fervent desire to fly, dug into his own pocket and leased a civilian plane for $25 a month. The plane, dubbed the *Noisy Nan*, never got off the ground. However, this did not dampen the enthusiasm of the young Marine, Lieut. Alfred A. Cunningham; and the following year he was ordered to the Navy flying school.

After only two hours and forty minutes of instruction, Lieut. Cunningham became the first Marine to fly. From then on, he continued to spark the development of Marine flying and so gained the title of "The Father of Marine Corps Aviation." From their first heroic action in World War I, through World War II and Korea, the Marines have landed their one-two punch—on the ground and in the air.

The First Marine Aviation Force carries out one of its many successful bombing missions over the Western Front in World War I.

From Pearl Harbor, Midway, and Guadalcanal, and across the Pacific to Tokyo Harbor, Marine fliers heroically proved their superiority in World War II.

It's Performance that Counts!

—and Phillips Petroleum Company, through its long, intensive research and painstaking experimental programs, is delivering outstanding performance in the field of aviation fuels. In fact, Phillips has led the way in the production of many of the major ingredients of aviation gasolines —including such high test components as Di-isopropyl and HF Alkylate.

Today, Phillips produces enormous quantities of 115/145 grade aviation gasoline for military and commercial use, and is also manufacturing improved fuels for the latest designs in turbo-props and jets.

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

In Korea, Marine Corps Aviation proved its effectiveness again and again when the chips were down.

Phillips 66

AVIATION PRODUCTS

FIRST TRANS-ATLANTIC FLIGHT DELIVERY OF A TWIN-ENGINE CESSNA 310 was completed last month for Cessna Aircraft Company by Pilot Jack Ford and Navigator Marvin Harness of the aircraft ferrying firm of Fleetway, Inc. They delivered the fast Cessna Twin to Zurich, Switzerland, and the Cessna distributor there, Flugzeug-Handels, A. G. Ford and Harness made the North Atlantic crossing in February despite some of the Northern Route's worst weather in years. They flew by way of Goose Bay, Labrador; BW-1, Greenland; and Keflavik, Iceland. The ocean-hopping Cessna is shown taxiing in after landing in bad weather at Zurich.
—(Flugzeug-Handels Photo.)

AIR Report
Significant Trends and News

FIRST BEECHCRAFT SUPER 18 DELIVERY ACROSS THE PACIFIC OCEAN TO JAPAN has been made, the airplane being delivered to Yomiuri Shimbun, Tokyo's largest daily newspaper, for Beech by Jack Ford, president of the Fleetway aircraft ferrying service of Burbank, California. Longest nonstop hop for the Super 18 was about 2,405 miles from San Francisco to Honolulu, which Ford completed in 14 hrs. 10 mins. at economy cruise power. He landed within 15 mins. of his ETA. The Super carried 586 gals. of fuel. It was equipped with six 50-gal. auxiliary tanks supplementing its normal 286-gal. supply. From Honolulu, Ford flew about 2,193 miles to Wake Island and then 1,873 miles to Tokyo.

CONTINUANCE OF VOR-DME AT LEAST FIVE MORE YEARS has been decided by the Air Coordinating Committee in resolving the recent conflict over adoption of the military TACAN system which would have phased out DME. The decision means DME will be retained in the "common system" until 1960 and will not be replaced then "until some succeeding common system has been installed and adopted on the Federal Airways System." As a result, Jim Riddle, president of Narco, announced his firm has resumed DME equipment shipments to aircraft owners. About 150 corporate aircraft, mostly DC-3, Lodestar, Beech Twin and Aero Commander types, have already been equipped with Narco DME. (See editorial, page 15, for ACC decision details.)

FLIGHT MAGAZINE

Including SOUTHERN FLIGHT and MODERN AIRPORTS

MAY, 1955 VOL. 43, No. 5

COVER: Beech Aircraft Corporation's M-S 760 4-place, twin-jet, 405-mph. business plane, pictured as it will be demonstrated by Beech through its distributors in the U. S. and Canada this summer as the world's first 4-place jet. Beech has made an agreement with a pioneer French firm, Morane-Saulnier, for the twin-jet and says this marks the Beech entry into jet aviation.
—(Beech Drawing.)

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIALS: EVERYBODY'S PROBLEM; PERMANENT CERTIFICATES; TACAN FIGHT RESOLVED; TOM FAGAN 15

Beech Jet for Business Fliers—WORLD'S FIRST 4-PLACE JET OBTAINED FROM MORANE-SAULNIER 18

Thunder-Buster for Hail Suppression—BY TOM ASHLEY—THIS PILOT TAMES THUNDERHEADS TO PROTECT FARM CROPS AGAINST HAIL DAMAGE 21

Ducted Fan for Flying Platform—HILLER'S RADICAL NEW VECTOR CRAFT 22

Record Performer—FIRST DETAILS OF CESSNA HELICOPTER'S PHENOMENAL CAPABILITIES 23

More Than Age Alone—BY JIM GREENWOOD—AT 72 MARCELLUS MURDOCK SCORES HIGHEST ON INSTRUMENT EXAMINATION . . 24

Safety Shift—FROM CAA TO THE INDUSTRY—HELPING AVIATION TO ATTAIN MATURITY 25

Airmen's Calendar—COMING EVENTS 34

Custom Beech Conversion—BILL REMMERT DEVISES BIGGER CABIN AND BIGGER WINDOWS FOR D18 TWINS 38

Questions and Answers for Operators 48

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager, P. O. Box 750 (1901 McKinney Ave.), Dallas, Texas—Telephone STerling 2125

FLIGHT MAGAZINE, May, 1955, Vol. 43, No. 5. Published monthly. Publication office, P. O. Box 750 (1901 McKinney Ave.), Dallas 1, Texas. Price 35c single copy. Subscription rates: United States, one year, $3.00; two years, $4.00; three years, $5.00. Established February, 1934. Entered as second-class matter at the Post Office, Dallas, under the act of March 3, 1879.

Copyright, 1955, by Air Review Publishing Corporation.

PHILADELPHIA
SEPT. 3·4·5

America's largest Aviation Show for America's greatest Industry

This year Philadelphia International Airport will furnish the setting for America's largest and most important annual aviation classic—the National Aircraft Show.

Here, in the East Coast's most concentrated population area, the aviation industry in cooperation with the U. S. Services will present to the nation its latest developments.

Spacious hangars will provide vast indoor exhibit space for engines, instruments, parts, accessories, equipment, etc. The adjoining concrete ramps will provide more space than ever before available for static outdoor exhibits of personal, commercial and military aircraft.

Its predecessor the 1954 Show received the acceptance of all the major plane and engine manufacturers, as well as a cross section of the manufacturers of component parts.

It is the only major aviation show for 1955 designated by the U. S. Department of Defense for full participation of the Armed Services . . . which will again dramatically present the progress of our air power . . . "on the ground" and "in the air".

For floor plan diagrams, exhibit space contracts, ticket information and complete details write—Benjamin T. Franklin, General Manager, NATIONAL AIRCRAFT SHOW, 400 UNION COMMERCE BLDG., CLEVELAND 14, OHIO

SPONSORED BY AIR FOUNDATION IN COOPERATION WITH THE CITY OF PHILADELPHIA, CHAMBER OF COMMERCE, GREATER PHILADELPHIA.

SANCTIONED BY NATIONAL AERONAUTIC ASSOCIATION

SALES OF CESSNA HAVE INCREASED $2,500,000 to a total of $22,850,000 for the first six months of its fiscal year, and President Dwane Wallace says the increase was accounted for by gains in commercial aircraft sales. As a result, Cessna has adopted a new annual dividend of $1 per share of stock, at a rate of 25 cents per quarter.

SHARPLY-INCREASED LIGHTPLANE SHIPMENTS for the first quarter of 1955 have been reported by the Aircraft Industries Association's Utility Aircraft Council for member companies. March shipments of 451 new planes valued at $6,421,000, brought to 1,099 planes valued at $15,994,000 the total shipped during the first quarter by seven manufacturers. This is an annual rate of about 4,400 deliveries valued at $64,000,000, as compared to only 3,071 planes valued at $43,461,000 in 1954. January-March figures for 1955 include the following:

Make	Number	Value
Aero Design	16	$ 1,070,000
Beech	167	6,192,000
Call Air	1	5,000
Cessna	425	4,688,000
Mooney	6	14,000
Piper	481	4,005,000
Taylorcraft	3	20,000
Totals	1,099	$15,994,000

(Models included 106 Bonanzas, 25 Twin-Bonanzas, 25 Super 18's, 142 Cessna 170B's, 243 Cessna 180's, 34 Cessna 310's, 175 Piper Super Cubs, 234 Pacers and Tri-Pacers and 72 Apaches.)

THE FIRST C-BAND RADAR FOR BUSINESS PLANES is the new RCA AVQ-10, for which AiResearch Aviation Service Company at Los Angeles is authorized distributor. Pictured is an AiResearch RCA radar nose installation on a DC-3. The AVQ-10 weighs 120 lbs. installed. United Air Lines has ordered 200 of the units, at $2,500,000, for fleet installation. Jack O'Brien, AiResearch manager, said he is also installing the set in an executive Convair 340 and in a second executive DC-3. Radar value cannot be overestimated, O'Brien said, for dependable business flying.

Robert F. Wood, Newport Air Park, Newport, Rhode Island.

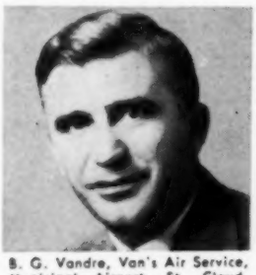
A M "Sime" Bertolet, Reading Aviation Service, Inc Municipal Airport, Reading, Pennsylvania

Max R. Brand, Aero Commander Distributors, Hangar 3, P.O. Box 8426, Municipal Airport, Tulsa, Oklahoma.

H. Leibee Wheeler, Buffalo Aeronautical Corporation, Buffalo Municipal Airport, Buffalo, New York.

Gene Hudman, Carolina Division of Southern Aero, Inc., Charlotte, North Carolina.

Don Vest, Vest Aircraft & Finance Co., P. O. Box 5306, Sky Ranch Airport, Denver, Colorado.



B. G. Vandre, Van's Air Service, Municipal Airport, St. Cloud, Minnesota.

Art Meurer, Arthur Meurer Co., Inc., LaGuardia Field, New York, N. Y.

H. Warren Holladay, Stonnell and Holladay, Easton Municipal Airport, Easton, Md.

Louis Humphreville, Executive Aircraft Corp., Detroit City Airport, Detroit 13, Michigan.

AERO DESIGN *Commander*

NATION-WIDE

SALES AND SERVICE

ORGANIZATION

Don Pennington, Southern Aero, Inc., Municipal Airport, Atlanta, Georgia.

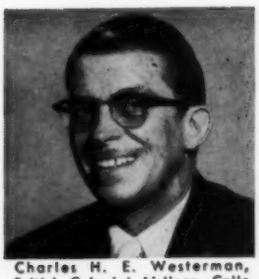
Peter Graves, Southern Ohio Aviation Sales Co., Dayton Municipal Airport, Vandalia, Ohio.

John A. "Jack" Baumann, Santa Monica Aviation, Santa Monica Airport, Santa Monica, California.

Paul Bailey Indianapolis Executive Aircraft Corp. Indianapolis Municipal Airport Indianapolis, Indiana

John Wilsdon, Executive Flying Corporation, P.O. Box 122, Lambert Field, St. Louis, Missouri.

O. B. Callen, National Aero Sales Corp., Midway Airport, Chicago, Ill.



Charles H. E. Westerman, British Colonial Airlines, Calle Lopez No. 1 — Despacho 502 Mexico, (1) D.F., Mexico

NATION-WIDE SALES and SERVICE

A E R O DESIGN *Commander*

AERO DESIGN AND ENGINEERING COMPANY

TULAKES AIRPORT • OKLAHOMA CITY, OKLAHOMA

IT COSTS LESS TO FLY

WITH CONTINENTAL POWER

Continental's continuing interest in its product, after the sale, makes a big reduction in the cost of plane ownership and use. Continental aircraft engines are not only built to absorb their full share of punishment, but backed with the kind of service that keeps them running year after year. When major overhaul time rolls round, the owner can replace his engine with a factory-remanufactured power plant—back to zero hours, and with factory new engine guarantee—at very low fixed cost and with virtually no dead time. Continental's Factory Remanufacturing Plan is one more in a long list of reasons underlying pilot preference for planes with Continental power.

• • •

PARTNERS IN MAKING PRIVATE FLYING THE SAFEST MEANS OF TRAVEL

1905 GOLDEN ANNIVERSARY 1955

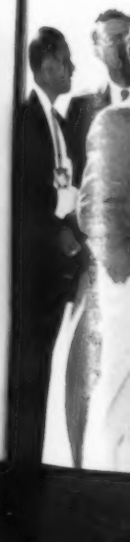
Continental Motors Corporation
Aircraft Engine Division
MUSKEGON, MICHIGAN

BONANZA CRUISING SPEED HAS BEEN BOOSTED 12 MPH. for a Bonanza owned by Vance Breese, prominent aero consulting engineer. AiResearch Aviation Service Division at Los Angeles reported the increase was obtained by smoothing off rivets and applying microscopic layers of special surfacing material to build up the wing leading edges and removing uneven contours.

FOUR NEW SALES FRANCHISES FOR AERO COMMANDER were reported last month by Aero Design Sales Manager Carl Wootten. They are: 1. Aero-Tex Corp., for the North Texas area at Dallas, with office at Dallas Aero Service on Love Field. L. S. McIntire, former aircraft broker, is general manager. 2. Santa Monica Aviation, for southern parts of California and Nevada, with Jack Baumann as general manager. 3. Stonnell & Holladay, for North and South Carolina, with office in the terminal building at the municipal airport in Charlotte, N. C. Gene Hudman, who has been with the Aero Design sales department, is manager for the Carolinas division of Stonnell & Holladay, an old established East Coast aircraft sales firm. 4. Henry P. Bush of Eternitas Trading, S. A., for Venezuela, Peru, Haiti, the West Indies, Dominican Republic and Puerto Rico, with office at Caracas. Bush has been with Pan American Airways and is well known in Latin American aviation circles.

Dr. Leslie A. Bryan, director of the University of Illinois Institute of Aviation and manager of the University's large airport at Champaign-Urbana, was elected **PRESIDENT OF THE AMERICAN ASSOCIATION OF AIRPORT EXECUTIVES** at their annual meeting in Tucson, April 18-20. Other officers include John Casey, Chicago, vice president; Milton E. Boelson, Evansville, Ind., second vice president; Joe Coulter, Norman, Oklahoma, third vice president; R. W. F. Schmidt, Tucson, secretary and Wilfred M. Post, Allentown, Pennsylvania, treasurer. New directors are Earl "Ole" Olsen, Duluth, Minnesota; Bill Eckenrod of Chattanooga, and Robert Crisp of Fort Smith, Arkansas.

Howard Aero Service of San Antonio is putting final touches on its **HIGH-PERFORMANCE SUPER VENTURA** production model, expected to fly May 15. Powered by R-2800 Mark I engines with "C" cylinders, the Super is reported to true out at 300 miles per hour at 64 per cent maximum continuous power. It grosses out at 31,000 pounds and Chief Engineer Ed Swearingen hopes to get the empty weight down to 18,000 pounds. It will carry 1,300 gallons of gasoline and has been engineered to fly on one engine at 110 mph. A planned production of 20 Supers justifies the heavy engineer-



The Learstar is a dramatically new kind of executive airplane. Its exceptional speed and range can be matched by only the latest four-engine commercial airliners. And—like these super-airliners—the Learstar is certificated in CAA's highest operational category—CAR, part 4b.

Learstar

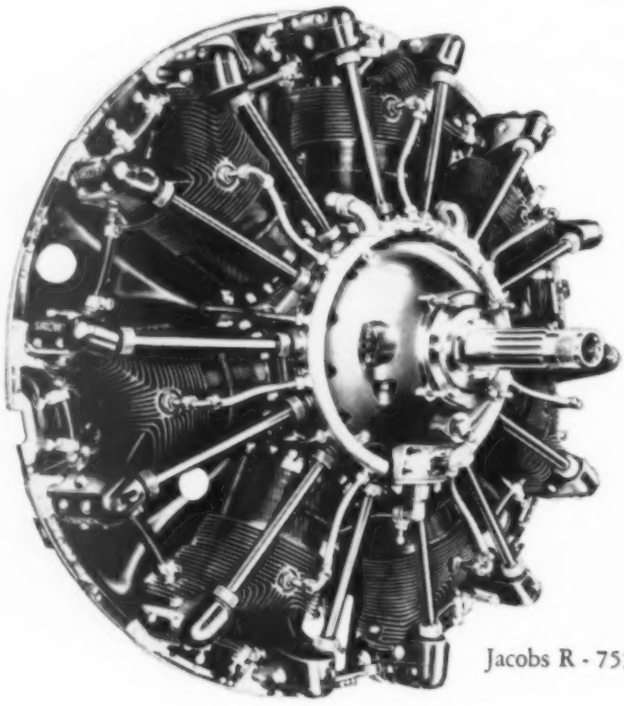
MODIFICATION OF FAMOUS LOCKHEED LODESTAR

WORLD'S FASTEST EXECUTIVE AIRLINER

LEAR INC. AIRCRAFT ENGINEERING DIVISION, SANTA MONICA, CALIFORNIA

LS-3

1953 Hours!



Jacobs R - 755 - A

And no appreciable cylinder wear

Figure the dollar value of this type of performance - - ADD the savings from a 50% increase in ring life and a 30% reduction in lube oil consumption . . . . . THEN you'll know why economy minded operators of business aircraft specify channel type PORUS-KROME

*PORUS - KROME

Good for the Life of your Engines

CAA approved for barrel reclamation

Write today for detailed information

Address -

Dept. F-1, VAN DER HORST CORP., OLEAN, N. Y.

VAN DER HORST

TRADE MARK

• TERRELL, TEXAS
OLEAN, NEW YORK
LOS ANGELES, CALIFORNIA**
HILVERSUM, HOLLAND

*U. S. Patents
2,048,578, 2,314,604, 2,412,698

**SparTan Engineering
West Coast Licensee

ing and modification costs invested in the design over the past 14 months, according to Dee Howard, president of Howard Aero.

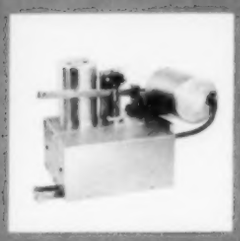
FISH SALMON, VETERAN LOCKHEED TEST PILOT, SURVIVED A BAIL-OUT last month when he had to leave the super-secret and supersonic F-104 fighter during flight tests over the California desert.

HOTTEST NEW ITEM OUT OF AIRCRAFT RADIO CORPORATION is the new 6½ pound course director originally developed as the "Orion" by Bob Haskins of Richmond, Virginia, who recently joined ARC. The course director combines magnetic information with the directional gyro information and puts it on a cross pointer to provide completely accurate directional course. The magnetic compass is remotely mounted and tied into a special Sperry directional gyro originally built to British specifications. The gyro contains a slaving mechanism which eliminates precessing. Operating with either omni or localizer the course director is set to desired heading and the airplane is flown to any desired track by reference to the cross pointers. Cost is around $1,700.

TOP AMERICAN HELICOPTER SOCIETY AWARDS late in April in Washington went to Bart Kelley, Bell Aircraft's chief helicopter engineer, who received the Alexander Klemin Award, and to Carl Agar, vice president of Okanagan Helicopters of Vancouver, B. C., world's largest commercial helicopter operation with 22 Bells and 8 Sikorskys, who received the Captain William J. Kossler Award.

(Continued on page 34)

PORTRAIT OF A GOOD DEAL shows Beech Sales Manager Leddy Greever (left) and Tulsa Distributor Gail Clark after negotiating the Beech factory's first new "floor-plan" financing of a C50 Twin-Bonanza. Using this plan, Beech distributors obtain extensive financial resources from Fourth National Bank in Wichita and National City Bank in New York, which participate with local banks through the Beech factory. "It's a natural for keeping demonstrators in action," Clark said.
—(Beech Photo.)



presenting the new

GYRO-STABILIZER for business aircraft

GLOBE

Here for the first time is a simple, dependable, low cost means of making business aircraft "spirally stable" and adding a great deal to ease of flying, comfort, and safety. The Globe Gyro-Stabilizer through proportional rudder corrections automatically keeps the airplane in essentially straight flight or in a desired rate of turn with exceptional stability. Ask for a demonstration.

GLOBE INDUSTRIES, *inc., dayton 4, ohio*

precision miniature motors, gyros, accessories for aircraft

Under Control

stable turns

Any rate of turn up to a needle-width can be made under control of the Gyro-Stabilizer by setting the "Trim-Turn" knob. The rate of turn selected by the pilot is automatically held with the Gyro-Stabilizer correcting for the effects of gusts and turbulence.

pilot has full control

The pilot can override the Gyro-Stabilizer at any time should he have to abruptly maneuver the plane. All it takes is a light push on the rudder pedals and the pilot has complete control. With feet off the pedals, the Gyro-Stabilizer immediately takes over again.

easy installation

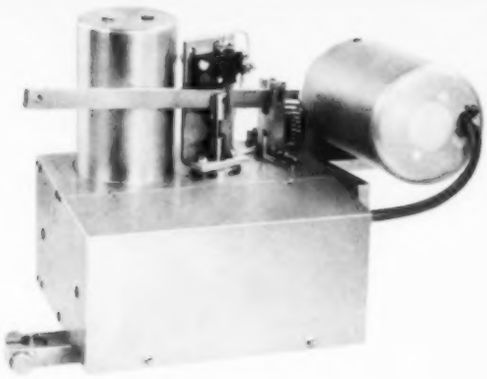
The Servo and Gyro units, cased separately, are installed together just aft of the baggage compartment for ready accessibility. These units weigh only 7 pounds. The "Trim-Turn" control can be mounted as desired within reach of the pilot.

safety

VFR and IFR pilots alike will find that the Globe Gyro-Stabilizer makes flying easier and navigation surer. Your plane will fly straight while you tune the radio or plot a new course. And it really takes the pressure off of qualified pilots flying IFR.

The Gyro-Stabilizer is approved and complies with all pertinent sections of C.A.A. Technical Standard Order–9a.

Why not drop us a line? We'd like to demonstrate the Gyro-Stabilizer to you through one of our distributors.



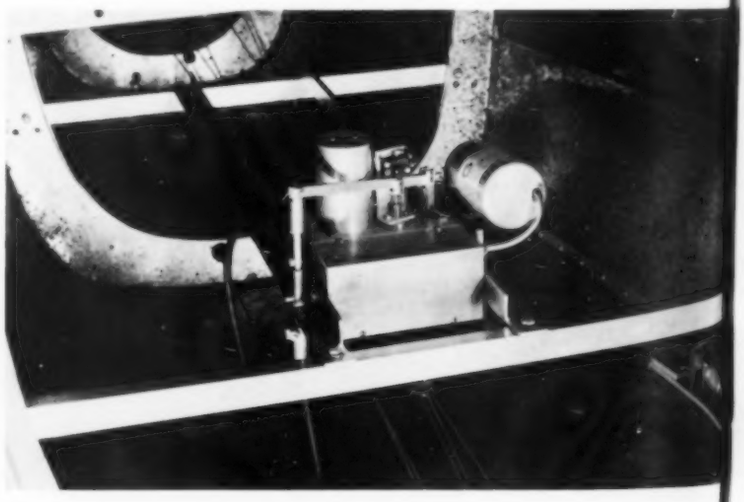
GLOBE GYRO-STABILIZER

The new Globe Gyro-Stabilizer is an automatic, single-axis rudder controlling device which increases flight safety, improves navigation, and makes piloting easier. It automatically detects and combats unwanted turns and thus completely overcomes the airplane's inherent tendency to go into a spiral dive.

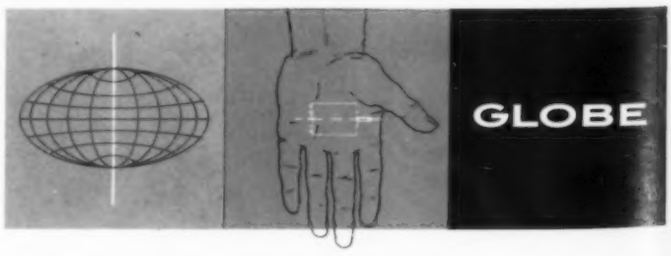
It is not a complete autopilot; however, in the yaw axis, it functions in the manner of an autopilot by making the airplane fly essentially straight.

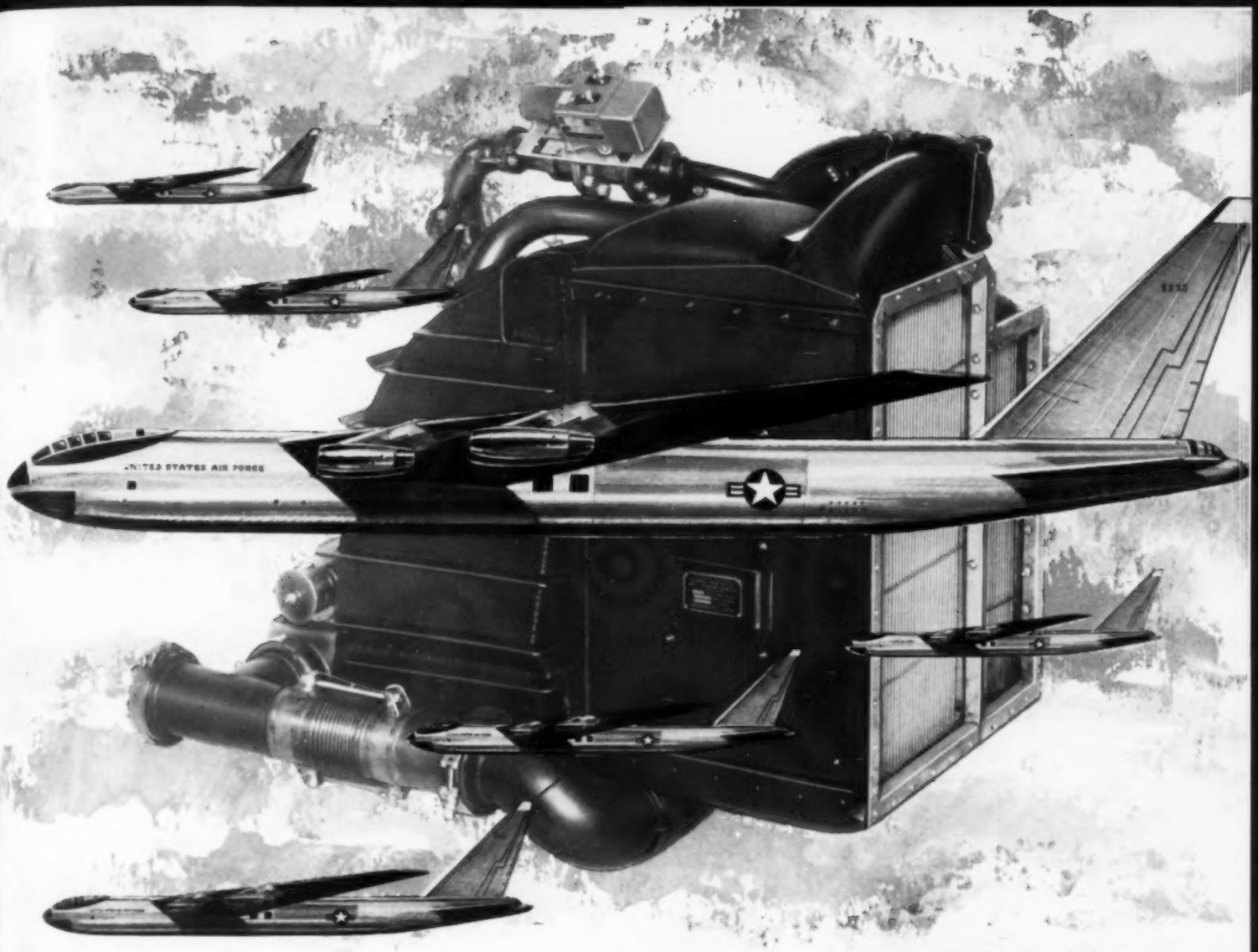
trims the plane

A wing heavy plane can be automatically trimmed for straight flight by the "Trim-Turn" control. A slight turn of the knob provides just the right amount of fixed rudder deflection. This fixed rudder position becomes the center about which the rudder automatically operates under the influence of the Gyro-Stabilizer to keep the airplane in straight flight.



GLOBE INDUSTRIES, *inc., dayton 4, ohio*





STRATOS

AIR-CONDITIONS THE NEWEST USAF BOMBER

THE EIGHT-JET BOEING B-52

The Boeing B-52 jet bomber entering operational service with the Strategic Air Command this spring becomes the world's first heavy jet bomber to go into service.

Joining its medium jet bomber teammate in SAC—the Boeing B-47—the B-52 "Stratofortress" greatly strengthens America's Air Arm. A high flying, high speed heavyweight with a range longer than that of any other operational jet aircraft, it is destined to be the backbone of SAC's striking force for some time to come.

To cool the crew and the tons of intricate equipment aboard the B-52, Boeing picked a highly efficient cooling system designed and produced by Stratos.

Builders of precision equipment for aircraft systems

STRATOS

A DIVISION OF FAIRCHILD ENGINE & AIRCRAFT CORP.

...where the future is measured in light-years!

Main Office: Bay Shore, L. I., N. Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles, Calif.

strike!

Carrier Task Force...
Sunday Punch of Your New Air Navy...
Helps Defend America's Freedom

Strike!...a carrier strike against enemy forces is one of our most spontaneous and devastating weapons ...a potent force for peace in a troubled world.

Strike!...carrier task forces, teamed with long range, land-based Air Power, patrol the seas ready to deliver shattering destruction when and where needed.

Strike!...your New Air Navy is jet propelled. Aircraft like the Chance Vought F7U-3 *Cutlass* arm mobile carrier forces with terrific power. Power that helps carry out your Navy's vital mission: control of the seas that cover 70% of the world.

Navy Fliers Challenge the Jet Frontier
Action, adventure...fellowship, prestige... and priceless training that fits you for the challenge of the new jet age...all wait for you as a Navy flier. If you are 18-25, and single, visit your nearest Naval Air Station or write NAVCAD, Washington 25, D.C.

CHANCE VOUGHT AIRCRAFT
INCORPORATED · DALLAS, TEXAS

DESIGNER AND BUILDER OF HIGH PERFORMANCE MILITARY AIRCRAFT SINCE 1917

Just among ourselves

EVERYBODY'S PROBLEM

A LARGE cross section of U. S. airport management heard an urgent plea last month in Tucson, Arizona, for municipalities to get busy and acquire clear land for runway approach zones before it is too late. The advice came from Carl B. Squier, executive vice president of the Lockheed Aircraft Corporation and a member of the board of directors of the largest privately owned airport in the world — Lockheed Air Terminal at Burbank.

Squier, who spoke at the 1955 American Association of Airport Executives' annual banquet, told how his company spent a half-million dollars on silencing devices, launched an effective community relations program, established new flight patterns for lessening the noise, but saw it all come to naught when a plane overshot a runway and crashed into a house just over the fence.

How many times have similar public agitations developed around airports, only to see the city fathers and experts throw up their hands in dismay, waiting for someone else to find the solution to public indignation!

Squier's insistence for acquisition of land along the approach or take-off zones beyond the runways certainly makes sense. But can the airport owners afford it?

In our opinion many airports will have to find the means to buy more land or pass into oblivion. The noise problem is bad enough; even if progress comes in noise abatement, many of our nation's airports need the protection no longer available through zoning regulations.

Citing the decrease in Los Angeles County from 60 airports in 1940 to 14 at the present time, Squier said that if government ownership of all airports is to be avoided, the sites must be granted special tax recognition as public facilities so that they can withstand the offers of real estate promoters looking for new subdivisions. In our opinion there is no more critical problem in civil aviation today than the demise of privately owned fields for the business flier.

We are gradually reaching the point where sales and utilization of business airplanes will be adversely affected by diminishing ground facilities. If the attrition rate continues for the next ten years as it has in the past decade a drop off in airplane sales is bound to come.

Airports are everybody's business, within or without the industry. Every last one of our citizens has an economic stake in our system of national airports but only a small percentage realize it. Airplane owners, manufacturers, the airlines, should be as concerned as the airport people with the recent negative trends of public opinion toward airports, curtailment of the Federal airport program and the vanishing fields in metropolitan areas that are going for housing developments.

Why can't U. S. aviation trade associations get together and work on the problem in unison? The warnings voiced by Carl Squier at the AA of AE annual meeting are sounded at the eleventh hour.

PERMANENT CERTIFICATES

A WELCOME piece of news at press time is passage of legislation by the U. S. Senate and House of Representatives providing permanent certificates of convenience and necessity to the nation's local service airlines. Only a few minor points need to be ironed out in committee and the President's signature of the final bill is practically assured. This action can be hailed as one of the most significant pieces of aviation legislation in recent history.

Local air service has long been out of the "experimental" stage, although the government has been slow to recognize that fact. True, many routes are experimental in nature, but an efficient Civil Aeronautics Board is perfectly capable of making the route patterns fit the requirements of public convenience and necessity and of the postal service.

It has been a long and difficult struggle since the first short term experimental certificate was granted shortly after the end of World War II. FLIGHT MAGAZINE's Sixth Annual Local Service Edition next month will reflect the amazing progress and growth of these vigorous carriers. They have proven beyond the shadow of a doubt that our smaller communities need and can support air service, that air transportation is not a luxury to be enjoyed by the larger cities alone.

With permanent certificates under their belts, our local service airlines will not only become more efficient but what's more important, they will be more economically sound. They now can go into conventional money markets for finance, preparing for the day when new airplane designs can be adapted to short haul service. Only with permanent certificates made possible by the new legislation can the local carriers hope to achieve the subsidy-free status of their older established brothers, the trunk lines.

TACAN FIGHT RESOLVED

ON April 10 the Air Coordinating Committee satisfactorily resolved, at least for the time being, the VOR/DME-TACAN squabble which reached fever pitch during the past sixty days after the Air Navigation Development Board voted to make the experimental and unproved military TACAN system the ultimate common system and phase out the VOR/DME system in common usage today.

Here's the substance of the new policy as established by ACC:

1. Military to proceed to implement

(Continued on page 46)

Chief Pilot Reeves, shown here with a Twin Beech.

Ask the men with the most experience . . .

ask **Merrill O. Reeves,** chief pilot for Ralph E. Fair, Inc., San Antonio, Texas

Chief Pilot Reeves says: "Gulf Aviation Products and I have been flying together for nearly 20 years. And right from the start, I learned that you just can't beat Gulf's great oils for dependability, service and protection. Gulf's really out front when it comes to meeting our demands for better aviation oils.

"Naturally, I've been using Gulf Aviation Gasoline, too, during all these years. I think those *Micronic Filters* on the Gulf pumps are pretty reassuring to a pilot. They tell him he's getting 'refinery-clean' gasoline pumped into his ship."

GULF
AVIATION PRODUCTS

GULF OIL CORPORATION
GULF REFINING COMPANY

To all pilots, Gulf recommends these two top-quality oils:

If your plane is powered with a horizontally opposed or Ranger in-line engine, your best bet is *Gulfpride Aviation Oil, Series-D.* It's a detergent dispersant oil that cuts down ring- and valve-sticking, high oil consumption, oil-screen clogging and plug fouling. Pilots say it stretches time between overhauls as much as 100%.

If your plane has a radial engine, or one that doesn't need a detergent oil, use *Gulf Aircraft Engine Oil, Series-R.* It retards sludge and carbon formation, and retains its body at high operation temperatures. Pratt & Whitney and other manufacturers approve it for all radial engines.

AND *Gulf Aviation Gasoline* . . . it comes to you "refinery-clean," for your safety, from pumps with advanced *Micronic Filters.*

We're Proud of our

CAMAIR 480

IT'S ECONOMICAL — IT'S POWERFUL

IT'S DEPENDABLE

The two Continental 240 H. P. engines provide a 192 MPH cruising speed, a climb rate of 1,750 FPM, and a service ceiling of 22,000 feet. This four place executive type aircraft at gross weight will climb 450 feet per minute on one engine.

Write today for more detail information.

Aviation

CAMAIR

MUNICIPAL AIRPORT · GALVESTON, TEXAS

A DIVISION OF CAMERON IRON WORKS INC.

Here is the Morane-Saulnier 760 "Paris" prototype on a recent flight in France. Beech Aircraft Corporation has concluded an agreement with the pioneer French firm to introduce the 4-place pressurized-cabin twin jet to U. S. and Canadian business fliers. Beech will demonstrate the 760 this summer, probably as early as mid-June.

Beech Jet for Business Fliers

World's first 4-place jet obtained in agreement with Morane-Saulnier of France

BUSINESS fliers are a step nearer the realization of jet travel in personal-type airplanes as a result of a working agreement between Beech Aircraft Corporation and the pioneering French firm, Morane-Saulnier Company. This summer, according to Beech, and possibly as early as the latter part of June, the Beech factory will demonstrate through its distributors the first 4-place, twin-jet airplane to become available to civilian purchasers.

The airplane Beech prospects will see and fly in is the Morane-Saulnier Model 760 "Paris," developed as a fast liaison airplane for military operation but considered as having excellent commercial possibilities on the American business plane market. Those who hop it will be introduced to al-

Astonishing performance for the M-S 760, with only 1,760 lbs. of thrust from two Marbore Series 2 jet engines rated at 880 lbs. each, includes frequent demonstrations at Mach .81 speeds slightly higher than 400 mph. It grosses 7,480 lbs. and, with full tanks for 360 gals. of fuel, has a payload capacity for 4 people and baggage.

—(Beech Drawing.)

Another view of the M-S 760 as it will appear on its American tour this summer. At 20,000-ft. altitude, pressurized cabin altitude is 7,800 ft. and cruising speed at that level is 350 mph. at normal power for an 875-mi. range including climb and letdown but allowing no reserve. Minimum stalling speed is 95 mph.

—(Beech Drawing.)

most noiseless and vibrationless speeds ranging up to Mach .81, or about 405 mph. maximum, and including 355-mph. cruising speed at 20,000 ft. in an air-conditioned, pressurized cabin in which a pressure altitude of 7,800 ft. is maintained while flying 20,000 ft. above sea level.

It's 360-gal. fuel capacity provides about 2 hrs. 45 mins. endurance at 350 mph., 3.3 hrs. at 294 mph., and 23,000 ft.

Whether Beech will begin immediate production preparations will depend on customer reactions during the demonstration tour. At present, the factory declines to speculate on pricing as well as production possibilities. However, the M-S 760 is not exactly an unknown development, already having been described in FLIGHT MAGAZINE and foreign publications. It was designed in a French Air Force competition for a trainer costing about $84,000.

Its builder, the Morane-Saulnier firm, is one of the world's pioneer aircraft companies. It was founded in 1911 and its efficient airplanes won praise from the beginning, one of these being a 1912 machine with a cowled engine and all-metal fuselage. Roland Garros flew a Morane-Saulnier across the Mediterranean for that sea's first aerial crossing in 1913.

The cost will be high for speed which is involved in the long stride from light propeller-driven twins in the 200 mph. class to twin-jet 300-400 mph. performance and all that goes with it, including important features such as cabin pressurization and air-conditioning which will make executive air travel far more desirable than it is now. To top 300 mph. in a twin now, a business firm must invest a minimum of about $300,000. But even at that price cabin pressurization

This photo of the M-S 760 was made last year, before the tip tanks were installed. Span is 33.3 ft., length 32.9 ft., and height 8.5 ft. From nose to tail, fuselage is in 4 sections. Nose section contains battery, generator, radio and oxygen supply in bottles. Cabin section seats 4 persons ahead of wing. Center section contains two Marbore Series 2 jet engines, main fuel tanks containing about 260 gals., two oil tanks with 3.6-gal. capacity, and baggage accommodations. Electric dive brakes are fitted beneath the wings.

—(Morane-Saulnier Photo.)

Beech twin-jet M-S 760 has a 4-place cabin about the same size as that of the familiar Beech Bonanza. Sliding capopy is used instead of a door. Engines are just behind rear seat, with wing-root air intakes. Four mechanics can accomplish an engine change for both jets in 50 mins.

(Morane-Saulnier Photo.)

First Jet Business Plane Data

Beechcraft—Morane-Saulnier 760 Specifications and Performance

Type: The M-S 760 is an all-metal, pressurized, air-conditioned, 4-place, mid-wing high-speed airplane powered by two Turbomeca Marbore 2 jet engines, each rated at sea level static thrust conditions as follows: 880 lbs. maximum thrust at 22,600 rpm. and 700 lbs. normal thrust at 21,000 rpm. The M-S 760 has a maximum design speed of Mach .81 and an ultimate load factor of 10 with 4 people, baggage and full main tanks.

Empty Weight (with equipment), lbs.	4,325
Weight of fuel and oil, lbs.	2,350
Weight allowance for 4 people and baggage, lbs.	805
Gross Weight, lbs.	7,480
Fuel Capacity (260 gals. in main tanks, 100 gals. in tip tanks), gals.	360
Cabin Pressure Differential, lbs. sq. in.	4.28
Cabin altitude at 20,000 ft., ft.	7,800

Performance

Maximum Speed, mph.	405
Maximum Mach Number	.81
Minimum Stalling Speed, mph.	95
Cruising Speed and Range (at 21,000 rpm.; with climb and letdown allowances but no reserve):	
At sea level and 350 mph., miles	530
At 10,000 ft. and 355 mph., miles	680
At 20,000 ft. and 350 mph., miles	875
Maximum Range (at 23,000 ft., 20,000 rpm., 294 mph. and with 3.3-hr. endurance), miles	970
Rate of Climb (22,600 rpm.):	
At Sea Level, fpm.	2,260
At 10,000 ft., fpm.	1,600
At 20,000 ft., fpm.	1,000
Single-Engine Rate of Climb (22,600 rpm., sea level), fpm.	600
Absolute Ceiling (22,600 rpm.), ft.	36,000
Service Ceiling (22,600 rpm., 100-fpm.), ft.	34,400
Absolute Single-engine Ceiling (22,600 rpm.), ft.	9,000
Take-Off Distance (at 105 mph.), ft.	2,500
Take-Off Distance Over 50 Ft. Obstacle (at 105 mph.), ft.	3,550
Landing Distance, ft.	1,850
Landing Distance Over 50 Ft. Obstacle, ft.	3,050

Dimensions

Span, ft.	33.3
Length, ft.	32.9
Height, ft.	8.5
Wing Area, sq. ft.	194
Cabin Length, ins.	65
Cabin Width, ins.	46
Cabin Height, ins.	48

NOTE: This data furnished by Beech Aircraft Corp., April 21, 1955, as compiled from M-S data dated December, 1954. Empty weight is said to include "equipment" but this equipment has not been listed.

is not available in the twin-engine 300 mph. category. Examples of such equipment are conversions of the Douglas A-26, Martin B-26 and Lockheed PV-1 bombers and the Learstar refinement of the Lockheed Lodestar.

While the M-S 760 is in the same bracket as the familiar Beech Bonanza as far as interior dimensions, payload and range are concerned, the two cannot be realistically compared because of wide differences. For one thing, the jet is a twin while the Bonanza is a single-engine craft. This classifies the jet as more comparable to the C50 Twin-Bonanza, but the structural requirements for almost twice the C50's design speed moves the jet far beyond the Twin-Bonanza category. Thus the M-S 760 is in a class all by itself, representing an entirely new horizon for business-plane users, and will have to be considered as such for any realistic appraisal. It is, in fact, the only 4-pl. jet in its class in the world.

Jet engine progress in the United States has lagged behind European developments, especially in small jet engines. This is due to U. S. emphasis on military aircraft in the jet field, in which Pratt & Whitney now claims world leadership in the development of large 10,000-20,000-lb. jet engines. In small jets, Fairchild and Continental Motors have led U. S. developments and their engines of 800 to 1,000 lbs. of thrust are used chiefly to power drone aircraft. Continental's small jets have been developed under license from a French concern, Turbomeca, and the Turbomeca Marbore Series 2 engine powers the M-S 760. Continental is tooling for production of the same engine for the new Cessna T-37 U. S. Air Force trainer. Cessna is tooling for T-37 production and the prototype has yet to be completely evaluated by the Air Force. This project may result in quantity T-37 production and eventually commercial 4-place jet production by Cessna.

Power Ratings, Fuel Consumption

A glance at the specifications and performance data provided by Beech and accompanying this article furnishes an interesting study of the twin-jet M-S 760. Sea level static thrust power ratings for the Marbore 2 engines range downward from 880 lbs. maximum at 22,600 rpm. to 630 lbs. at 20,000 rpm. at 90 per cent of normal rated power. Normal rating is 700 lbs. of thrust at 21,000 rpm. for continuous operation.

Fuel consumption for jet engines varies but, under all conditions, is enormous when compared with the

(Continued on page 31)

After trying a Stearman, Vultee BT, Curtiss P-40 and Douglas A-20, Jim Cook bought this North American P-51 from Bendix Trophy Winner Joe de Bona for high-altitude cloud-seeding. Silver iodide is burned in a generator located in the engine compartment and exhausted inside thunderheads at 30,000 to 35,000 ft. to induce cloud nucleation for the suppression of hail.
—(FLIGHT MAGAZINE Photo.)

Thunder-Buster for Hail Suppression

Thunderstorms are more powerful than atomic bombs, but this flier tames them to protect crops

By TOM ASHLEY

WE'VE seen people make money in airplanes in a lot of different kinds of air work. Flying evangels who drop religious tracts for revival meetings, corpse haulers, whiskey runners, Arctic mercy pilots, eagle hunters, flying newsboys, wild game census takers, autogiro border patrolmen, skywriters, crop dusters, uranium prospectors, instrument flight pioneers, ocean-hopping ferry pilots — the list is long and familiar. But none can compare with the sky profession practiced by a Texas pilot named Jim Cook when it comes to flying after a pot of gold the hard way.

One way to describe Cook's work is to say simply that he knocks the tops off thunderheads to keep them from damaging crops with hail. Jim and the farmers who pay Cook for this call it "hail suppression" and how it works involves the fundamentals of induced nucleation of clouds. These same fundamentals are tied in with rain-making, which has caused a lot of eyebrow-lifting since a General Electric Company scientist first demonstrated artificial cloud nucleation in 1946. But Jim Cook does not deal in rain-making.

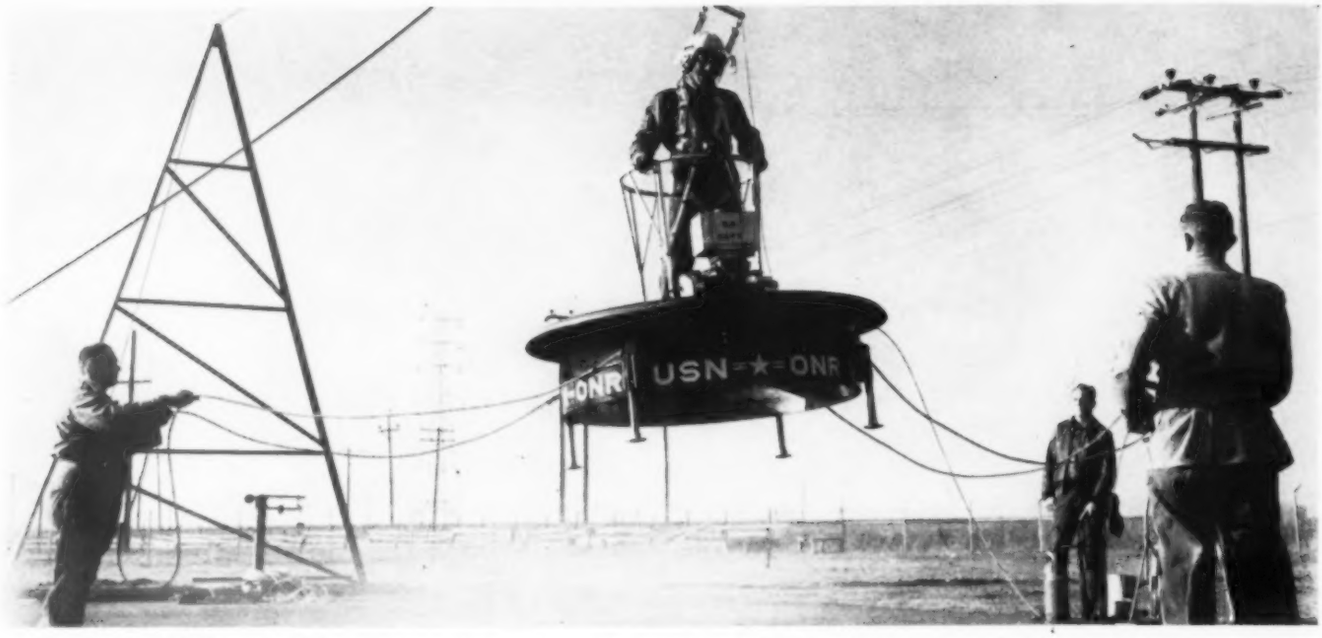
"All I have to do," says Cook, "is keep thunderheads from hailing out crops. It is more practical for me to deliver the goods than for the rain-maker — he's trying to make something happen and I'm trying to suppress something to keep it from happening."

Thunder-buster Jim Cook in his Mustang. This will be his third year of cloud-seeding on contract to farmers in the area of Scottsbluff, Nebraska, for whom he has successfully reduced crop damage from hail storms with his aerial methods.
—(FLIGHT MAGAZINE Photo.)

This will be Cook's third year of operating and he has been successful the first two years, as actual figures show. He lives at Jacksboro, Texas, where he raises cattle, but he operates his flying service out of Scottsbluff, Nebraska. That community is in the center of the nation's greatest area of hail storm activity. His customers are beet, bean, potato and corn farmers and local bankers and businessmen who are doing something about the weather with an organization called the "Valley Hail Suppression Association." Their domain is a strictly local one comprising about 250,000 acres of rich farm land in an area measuring about 30 by 70 miles, pinpointed along the North Platte River in Western Nebraska adjacent to the Wyoming line.

Acreage figures for the last four years show that damage to crops in "hail valley" has declined sharply since the association's hail suppression program was inaugurated in 1952. Statistical studies are tricky, but they do

(Continued on page 40)



First flights with Hiller "flying platform" were tethered experiments. Device is a U. S. Navy experiment.
—(Hiller Photo.)

Ducted Fan For Flying Platform

A WINGLESS flying platform for one-man flight using greatly simplified control principles is being developed by Hiller Helicopters for the U. S. Navy.

The odd craft combines the principle of control by weight shifting, which makes it a "vector" craft, with a new method of propulsion by "ducted fan."

It is the first ducted-fan type of vertical take-off aircraft to fly while carrying a man. Hiller says variations of the principle have been flown while tethered, but that its Navy research platform is the first to achieve piloted free flight.

Complete details were not divulged, but the control principle is similar to that described in this magazine last month for the de Lackner "helivector." Control is by the pilot shifting his weight by leaning in the desired direction of flight while flying standing up, as in skiing. This shift in weight changes the center of gravity and this alters the relation of the machine's lift and thrust vectors for directional control.

Unlike the de Lackner research machine, which uses helicopter rotors, the Hiller vector-craft utilizes smaller propeller-like blades which are enclosed in a ring or circular cowl-like enclosure which ducts the airflow.

A forerunner of the platform was developed by Charles H. Zimmerman and tested by Hiller in 1947 but free flight was not achieved. In 1952 the National Advisory Committee for Aeronautics flew a tethered device of the same type with Zimmerman and Paul Hiller as NACA project engineers. ★ ★ ★

Take-off and free flight of the Hiller machine are pictured above. Pilot leans to shift weight in direction of flight. This change in the center of gravity alters relation of lift and thrust vectors.
—(Hiller Photos.)

Cessna CH-1 has nose-mounted supercharged Continental engine rated at 260 hp. up to 10,000 ft., and can hover at unprecedented altitude of 15,000 ft. with 2 occupants or at 11,000 ft. with 4 occupants. At 3,000-lb. gross, useful load is 1,025 lbs.
—(Cessna Photo.)

Record Performer

HIGH performance exceeding that of any other currently licensed helicopter is now claimed by Cessna Aircraft Company for its new 2- to 4-place CH-1 helicopter in advance of formal licensing of the craft. At 3,000-lb. gross weight, the 260-hp. Cessna has a 1,025-lb. useful load.

Chief claim to record capabilities is the CH-1's hovering ceiling of more than 15,000 ft. above sea level with two persons and a hovering ceiling of 11,000 ft. with 400 additional pounds in occupants or cargo. This is unprecedented performance for a helicopter. It exceeds Cessna's original expectations.

It is also described in newly-revealed details as having the highest top speed approved for helicopters — 122 mph. at sea level, 110 mph. at 5,000 ft. and 96 mph. at 10,000 ft. The Cessna's speeds are obtainable with full engine rpm. range at all altitudes.

"The CH-1 will be certificated for performance higher than other licensed helicopter," reports Jack Leonard, manager of Cessna's helicopter division. No date for licensing was listed but it is understood that all required performance tests and other preliminary work require only the formality of CAA certification.

(Continued on page 51)

Cessna CH-1 — 2-4-Place Helicopter

Factory Data, April 29, 1955

Power Plant: Continental FSO-470-A supercharged, fan-cooled engine, rated at 260 hp. (net after cooling) at 3,000 rpm. from sea level up to 10,000 ft.

Max. Gr., lbs.	3,000
Empty, lbs.	1,975
Useful Load, lbs.	1,025
Max. Spd., SL, mph.	122
Cr. Spd., mph.	100-120
Rate of Climb, SL, gr. wt., fpm	1,150
Time to Climb, SL to 10,000 ft.—	
2,600 lbs., mins.-secs.	7-36
2,800 lbs., mins.-secs.	8-27
3,000 lbs., mins.-secs.	9-27
Hov. Clg., 3,000 lbs., ft.	11,000
Hov. Clg., 3,000 lbs., 95 deg., ft.	8,000
Hov. Clg., 2,600 lbs., ft.	Over 15,000
Fuel Cap., gals.	60
Endurance, hrs.	3.8
Range, mi.	290
Main Rotor, metal, 2-blade—	
Diameter, ft.	35
Blade Chord, ins.	13
Disc Ldng., lbs. sq. ft.	3.12
Tail Rotor, metal, 2-blade—	
Diameter, ft.	7
Power Loading, lbs. hp.	10.2
Overall Ht., ins.	99.75
Ht. of Rotor, ins.	96
Ht. to Top of Cabin, ins.	85.9
Fuselage Length, ins.	385
Overall Length, ins.	512
Fuselage Width, ins.	64
Overall Width, ins.	99.75

In hovering, CH-1's free-floating stabilizer on tail boom angles down in rotor stream. In forward flight, it is horizontal (see photo above). Rotor shaft in cabin is between two front seats.
—(Cessna Photo.)

Marcellus Murdock learned to fly at 46. That was in 1929 and he is now 72 and is flying his fourth airplane, a Beechcraft Bonanza. He is shown above (left) taking delivery of his 1947 Bonanza from the late Walter Beech, the manufacturer. Murdock's recent radio navigation score in the written exam for an instrument rating was the highest ever recorded by CAA. The Wichita newsman-pilot is shown at left in a series of candid snaps for FLIGHT MAGAZINE by Jim Yarnell, Beech cameraman.

More Than Age Alone

By JIM GREENWOOD

PUBLISHER Marcellus M. Murdock of the Wichita *Eagle*, who offers himself as proof that "you're never too old to fly," may very well be the nation's number one sportsman pilot. Few pilots who fly for the sheer joy of it would contest the title. In fact, even fewer hold Federation Aeronautique Internationale credentials that certify them in that category. Murdock does. Moreover, his FAI card, issued in 1929, bears the signature of Orville Wright, then contest chairman of the world's only official organization governing aeronautical sport

"Imagine me being classed as a sportsman pilot at my age," the 72-year-old airminded publisher told FLIGHT MAGAZINE.

Today, with some 4,500 hours to his credit, he is still one of the most active private fliers around. Over the years he has owned and worn out four airplanes and is now working on his fifth — a four-place Beechcraft Bonanza which he purchased in 1947.

Last February the Civil Aeronautics Administration announced that Murdock had achieved the highest mark ever recorded in the radio navigation section of CAA's instrument rating exam. Naturally, in light of the applicant's age, plus the fact a near-perfect examination paper was a sensation in itself, the announcement attracted considerable notice from coast to coast. But Murdock himself was unmoved.

"I don't believe a man deserves attention just because he does something in his advancing years," Murdock commented. "Accomplishments should stand on their own merits."

Certainly the accomplishments of this businessman-pilot, especially in his native Kansas, can speak for themselves. His personal enthusiasm for flying and his many years of effort toward furthering aviation contributed much to the present stature of the booming air industry.

The flying publisher has been associated with his newspaper for the past 50 years. A family enterprise, the paper was founded in 1872 by his father, Marshall M. Murdock, a well known pioneer in the development of the Midwest.

Years ago when Marcellus first thought about flying as a hobby, his brother, the late Victor Murdock — long the *Eagle's* editor-in-chief, attempted to discourage the idea. Finally Victor relented, begging his brother

to fly only when the weather was fair.

Marcellus M. Murdock is the picture of glowing health for a man in his seventies. He passes each successive CAA physical with the ease of a high school athlete. Short, stocky, and scholarly, he has the vitality of a man half his age. His warm grin and twinkling eye, capped by a distinguished thatch of thinning white hair, are a familiar sight at dozens of airports throughout Kansas and neighboring states.

There have been many stories about Murdock's flying, some fact and other legend. Most of them, though, are true — like the time he used a flashlight to execute his first night landing. Another story that made the rounds in local CAA circles concerned his rather informal radio procedure. As the tower operators tell it, Murdock would acknowledge calls simply by saying, "Go ahead, I'm listening."

Actually, this genial gentleman was a "Johnny-Come-Lately" to aviation by modern standards. He took up flying at 46, when most men of his age were looking forward to the tranquility of retirement.

He likes to recall the day back in December of 1928 when he, the late Walter Beech — a close personal friend—and several others were sitting on bales of hay in an open field discussing the city's future in aviation. The hay was stacked in the same prairie land for which he and others had chipped in $100 each and leased as an air strip. That original tract is now the site of the Beech Aircraft Corporation.

"I asked Walter why he didn't teach me to fly," reflected the publisher. "Beech replied, jokingly, that I was too old. So I told him that if he'd furnish the plane and instructor, I'd

(Continued on next page)

Publisher Murdock (right) at the busy city desk in the Wichita Eagle's newsroom.
—(FLIGHT MAGAZINE Photo by Jim Varnell, Beech)

Safety Shift - - From CAA to the Industry

THE Civil Aeronautics Administration is moving more rapidly than most aviation people realize toward shifting safety responsibility to industry.

A gradual trend in this direction has been under way for a number of years, as typified in the designee system. More than 5,000 persons employed in private industry have been designated by the Administrator to make various inspections on his behalf for purposes of air safety.

The trend has been accelerated, however, by the remarks of President Eisenhower in his annual budget message to Congress, in which he said:

"With the increasing maturity of civil aviation, the Federal government soon should be able to reduce substantially its safety promotion and enforcement activities without affecting the present high level of safety. I have requested the early preparation of a plan, in cooperation with industry, to achieve this objective."

Adding emphasis to these words is the fact that the President's budget request asked Congress to provide funds for "development of a positive program for shifting responsibility for safe operating practices to the industry." This money is expected to become available about July 1.

Four days after the President delivered his message, A. S. Koch, director of the CAA Office of Aviation Safety, appointed a committee to prepare a proposed plan and report back to him.

The committee, now meeting at frequent intervals, is chaired by W. H. Weeks, chief of the aircraft engineering division. The other members are the division chiefs of the Aviation Safety Office; E. B. Franklin, air carrier; E. W. Hudlow, general safety, and W. R. Stovall, medical.

The following instructions were issued to the committee by Koch: "The work of the committee will be guided by the general objectives stated in the President's message and in the budget. The specific mission of the committee is to develop a comprehensive body of concrete proposals as to:

"1. Aviation safety activities for which the primary responsibility should be *transferred* to industry or private parties, including quite possibly some that are now handled through delegation.

"2. Aviation safety activities which should be delegated.

"3. Aviation safety activities that should be eliminated or substantially reduced.

"4. Basic changes in the direction, management, approach and manner of execution of aviation safety activities which would improve efficiency and economy.

"In developing these proposals, the committee should consider only their contribution to the purpose announced by the President and their effects on safety. Proposals which, when evaluated collectively and in perspective, would adversely affect the present high level of safety should be excluded. The committee is definitely *not* to rule out proposals on the ground that they cannot be implemented under existing law, regulations, or methods of program administration.

"Each committee member will be expected to apply his initiative and his judgment throughout the entire range of aviation safety activities. As a committee member, he is to function primarily as a safety official and only secondarily as the representative of one segment of the program. The committee may by-pass organizational channels to obtain direct opinions from individuals at any level in any part of the Washington Office of Aviation Safety.

"Committee decisions on particular proposals shall be reached by a majority. In the case of tie votes, the chairman and one other member shall be considered as constituting a majority when necessary to expedite the committee's business. The chairman and each member shall have the right to submit a minority report.

"The committee is authorized as necessary to draw upon the services of aviation safety Washington, regional and field personnel, making arrangements for this through appropriate channels.

"The importance of the committee's assignment is so apparent as to require no further emphasis. In its execution, the committee will be required to plan constructively within

(Continued on page 51)

PROPOSED AIRCRAFT IDENTIFICATION, on which CAA has requested comment from aircraft owners, would look like the above. CAA proposal would eliminate wing lettering. Neutral on the matter, Piper Aircraft circulated the above photo to show how the proposed 12-in. lettering would appear on its popular Tri-Pacer.
—(Piper Photo.)

MORE HOME-BUILT LIGHTPLANES ARE MAKING THEIR APPEARANCE and among the latest is this single-seat sport plane built by Lawrence K. Heuberger of El Paso, a Continental Air Lines DC-6 flight engineer and member of the Experimental Aircraft Association. He says the plane has a 90-hp. Continental engine, metal wings, flaps and ailerons and fabric-covered fuselage and tail group. It weighs 616 lbs. and will top 197 mph., cruising at 173. It stalls at 70 clean and at 60 with 40-deg. flap. Span is 18 ft., length 16.5 ft. and wing area is 68 sq. ft. Wing-tip tanks are to be added to supplement its 12.5-gal. main fuel tank. Total costs of purchased parts and equipment came to $800, but friends gave him other spare parts which would cost about $200 if bought. He spent 14 months on it. Heuberger said he will have blueprints for others interested in this design.

Champion 7-EC In Production

CHAMPION Aircraft Corp., Holman Field, St. Paul, Minnesota, is aiming at a production rate of 1 airplane a day this summer for its 2-place, tandem, 90-hp. Champion 7-EC (above), which was developed from the familiar Aeronca after Champion acquired rights to the airplane. It began delivering one a week in March.

At a gross weight of 1,450 lbs., the Champion has a useful load ranging up to 750 lbs., a 105-mph. cruising speed, 800-fpm. rate of climb and 44-mph. landing speed. It has 18.5-gal. fuel supply, 50-lb. baggage compartment. Span is 35 ft. 2 ins., length 21 ft. 6 ins. and wing area 170.22 sq. ft.

List price is $3,795. Optional equipment includes electrical system and starter, McCauley propeller, lights and parking brakes.

show him whether I could fly or not."

Murdock did learn to fly — in a Beech-built OX-5 Travel Air, which he subsequently bought. In the years that followed he had his share of experiences, during which he "retired" two more Travel Airs and a Cessna. A broken front tooth attests to a "bumpy" landing in a 240-hp. open-cockpit biplane.

"The impact didn't do it," he said, smiling. "The ship ended up on its back and I cracked my chin when I unfastened my belt and fell out."

Flying the Hard Way

He also remembers having valves pop through the tops of cylinders. The first time it occurred on a flight to Topeka. Murdock, thoroughly frightened by the sight of smoke pouring from the engine, put down in the nearest pasture. The next time it happened he was a "little scared" but flew on to an airport. From then on, he accepted "popping valves" as a matter of course.

"Some people might think I took chances deliberately," he said. "Maybe I did. Maybe I was trying to make up for what I had missed — what I would have liked to have done — during the barnstorming days."

Once an acquaintance commented, "Marcellus, the Lord sure had His arms around you." He still wouldn't trade his flying experiences for any ten years of his life. In retrospect, Murdock philosophized that as a man grows older, whatever he lacks in agility and reflex, he more than makes up in good judgment.

Private flying offers to him adventure, sensation, and a fullness of life not found in any other form of relaxation or recreation. He's in the air on just about any good day he can break away from his desk. Frequently he flies before breakfast. "I love the emotions that come with flying," he says.

With the exception of the war years when he put aside the pleasures of personal flying, Murdock has flown continuously since that day he soloed 26 years ago. And he has operated most makes of conventional light planes and some other types, among them an old Curtiss flying boat and more recently an 85-ton Boeing KC-97 tanker.

Having grounded himself temporarily in World War II, the old flying urge was re-born with peace. He also saw the postwar airplane as a useful business tool, one which would perform a variety of services for his newspaper and radio operations, particularly in the field of news and sports coverage.

Murdock wound up with the 69th

Beechcraft Bonanza to come off production lines which have since turned out 4,000 more Bonanzas. It's the same plane he flies today, though now it's fully equipped with the latest aids for all-weather flying.

News Beats by Plane

The *Eagle* and its "voice," radio station KFH, have scored numerous beats in bringing to readers and radio listeners on-the-scene reports of all sorts of happenings ranging from flash floods to murder. One dreary night a few years ago, Murdock flew a reporter and photographer to a remote section of Oklahoma where police were holding a man suspected of killing a Wichita couple. The opposition paper had also hired a plane and pilot to get the story, but got scooped instead.

"The other boys elected to fly a direct course and got lost. I followed the lighted airway, a slightly longer route, yet we arrived in plenty of time to get an exclusive. That's an example of the judgment that comes with age."

Commercial aviation was still in its infancy when Murdock, Beech, the late Clyde Cessna, and other airminded civic leaders envisioned Wichita as an ideal center for aircraft manufacturing and air transportation. The city's strategic geographic location in the hub of the continent gave it every natural advantage.

Thus, as a result of progressive men like Murdock and his friends, whose foresight, determination and leadership inspired others, Wichita aviation began to grow by leaps and bounds. Today the city is America's leading producer of business aircraft. It is also busily engaged in defense production. Both Beech and Cessna build planes for the military, and Boeing's Wichita division produces the B-47 Stratojet and soon will turn out the mammoth B-52.

Helping Build Airports

Through the years Murdock took part in developing three municipal airports, including Wichita's handsome new $10,000,000 field. Virtually alone, he fought for and got a diagonal highway connecting downtown Wichita with the former city airport, now occupied by McConnell Air Force Base, the country's only B-47 jet training school.

Between 1929 and 1938 he headed the Chamber of Commerce aviation committee. On one of the early Kansas air tours, which he originated, 36 wheat fields were turned into airports. Only six survived, but Murdock feels that the state today is at least six airports ahead. He has also served as president of the Wichita chapter of the National Aeronautic Association.

Always holding the interests of all facets of aviation close to his heart, the venerable pilot has done much to promote air markers throughout Kansas. And he numbers among his friends Blanche Noyes, chief of the CAA's national air marking section.

The camaraderie within the flying fraternity is among the many great rewards of being a pilot, said Murdock, who likes to think of himself as just one of the boys, which is precisely what he is. Nothing pleases him more, except of course to fly, than to do a little hangar flying with the gang. Few can match his tales, though, especially the ones he tells on himself.

His candid observations on flying are seasoned with salty jargon but well blended with an ample portion of homespun philosophy. And, in his own words, he has met "the great, the near great, and the not so great," counting among his favorite aviation acquaintances such personalities as Lindbergh, Doolittle, and the late General H. H. Arnold, "who was exiled to Fort Riley for siding with Billy Mitchell."

One of his fondest memories is that of a 9,000-mile aerial junket to Alaska, the Yukon and the Canadian Northwest, which he made in 1949 with Beech and Art Goebel. Flying a Beechcraft Model 18, the party at one point crossed the Arctic Circle.

"I'll never forget that trip," he said. "Sure, I did a lot of the flying, but the thing I remember most was losing my FAI lapel pin. Of all the buttons I own that identify me as a pilot, that FAI pin was my proudest possession!"

But he is equally proud of the fact that he is among the few active pilots who have bridged two generations of airmen. And he is ready with some advice to the younger generation:

"I never flew so much that every landing wasn't a thrill. But never be afraid of an airplane — and, above all, always respect it!"

Perfection in Flight

Associates recently questioned the wisdom of his going to all the trouble of learning how to fly by instruments. To Marcellus Murdock, qualifying for an instrument rating presents a new challenge in flying. No man, in his opinion, is a real flier until he is a proficient instrument pilot. "Besides, it's fun," he added.

"The ability to fly by instrument reference alone instills confidence in the pilot's capabilities," he said, "whether he takes flying seriously, as a career, or merely flies on Sunday afternoons. Even if he never uses it, the knowledge is good insurance."

He started working toward his rating last year. Now all that remains is the flight test, which he intends to take when he considers himself sufficiently polished. At every opportunity he's at the controls of his Bonanza, practicing radio range orientation, procedure turns, and controlled approaches — double checking himself against time, heading and altitude.

"Sure, my goal is perfection," he said. "I work hard toward improving my technique and I won't be satisfied until I can achieve absolute precision. Call it vanity, pride, conceit, or whatever you wish, but that's my goal."

That's why friends are betting he'll pass the practical with the same flying colors that he did the written. ★ ★ ★

CAA LICENSING OF RILEY 55 AS A NEW AIRCRAFT TYPE has been announced by Temco Aircraft Corp., Dallas, which said it is the first light twin conversion ever licensed as a new aircraft type. Extensive CAA examinations of performance and structure were the same as those used for licensing a completely new aircraft design. The new 4-place Riley 55 has two 170-hp. Lycoming 4-cylinder engines, a 106-gal. fuel system with optional 20-gal. tip tanks, an airline-type control quadrant and other advanced features. With tip tanks, it has a 1,200-mi. maximum range. It cruises at 170 mph., Temco says, and gross weight is 3,600 lbs. Constant-speed, full-feathering Hartzell propellers are used. Left to right in the picture are D. L. Hearne, Temco chief engineer at its Greenville plant; Greenville Plant Manager E. Fred Buehring; C. W. (Ted) von Rosenberg, CAA Region 2 chief of flight test, who presented the new license, and F. T. Melton, CAA Region 2 power plant chief.

—(Temco Photo.)

the new *Super 18*
Beechcraft

Time for Decision!

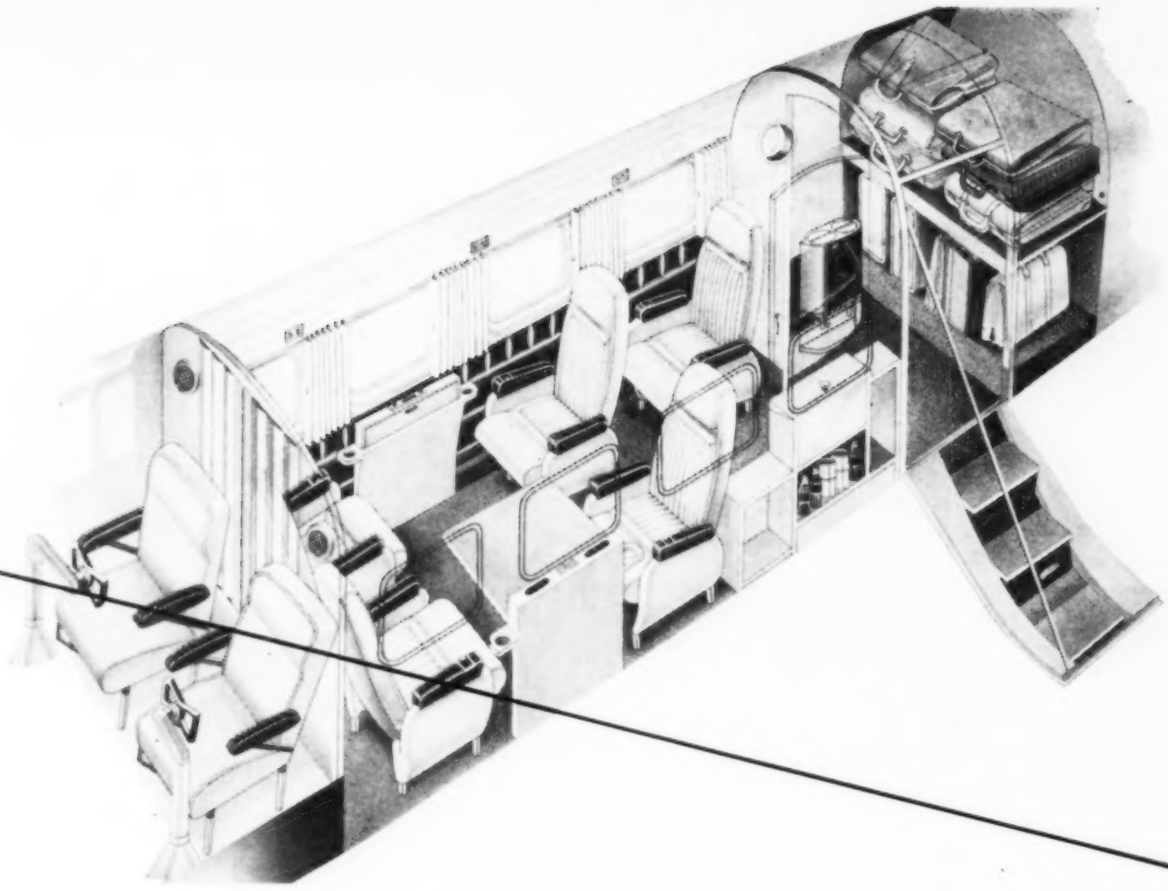
Time... the priceless commodity money can't buy... is the only factor restricting the activity of many a corporate executive. The demands for time... to consult plant managers and technicians... to inspect far-flung facilities... to call on business contacts... exceed the working hours available and the physical capabilities of over-worked executives.

In the competitive business world of today, Beechcraft ownership opens the way for business expansion... increases executive activity... *by saving time.* With a Beechcraft, company executives have more time for business and more time for pleasure, too!

The Super 18 Beechcraft is an airplane that can be purchased with confidence... not only in its ruggedness, reliability, and adaptability, but also with confidence that it will deliver the ultimate in comfortable air travel.

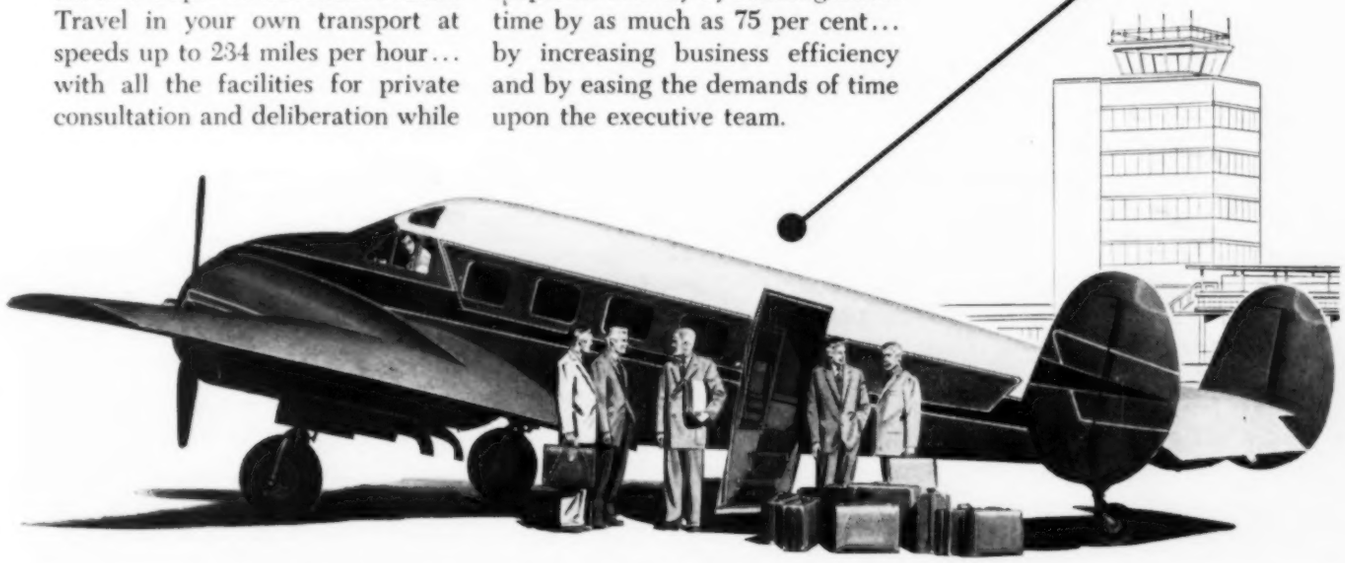
Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



Executive Suite

Luxurious comfort... relaxing quiet dominate the spacious interior of the new Super 18 Beechcraft cabin. Travel in your own transport at speeds up to 234 miles per hour... with all the facilities for private consultation and deliberation while on the way on important missions. The Super 18 pays dividends to any corporate activity by slashing travel time by as much as 75 per cent... by increasing business efficiency and by easing the demands of time upon the executive team.



★ASK ABOUT BEECHCRAFT'S NEW EXCLUSIVE LEASING PLAN.

Typical costs, operating data on request from Beech Aircraft Corp., Wichita, Kansas, U. S. A. — or from any of the following Beech Distributors:

Albuquerque—Cutter-Carr Flying Service, Inc.
Amarillo—Tradewind Airport Corp.
Atlanta and Birmingham—Southern Airways Company
Butte—Butte Aero Sales & Service, Inc.
Charleston—Hawthorne Flying Service
Chicago—Butler Airplane Sales
Dallas—J. R. Gray Co., Inc.
Davenport—Elliott Flying Service
Denver—Mountain States Aviation, Inc.
Houston—J. D. Reed Co., Inc.
Indianapolis—Roscoe Turner Aeronautical Corporation
Lansing—Francis Aviation
Lantana—Florida Airmotive, Inc.
Memphis—Memphis Aero Corp.
Milwaukee—Anderson Air Activities
Nashville—Capitol Air Sales, Inc.
New Orleans—Magee Aircraft Co., Inc.
New York City—Atlantic Aviation Corporation
Oakland—Pacific Aircraft Sales Company
Oklahoma City—Aircraftsmen, Inc.
Omaha—C. J. Abbott & Co.
Philadelphia—Atlantic Aviation Service, Inc.
Portland—Flightcraft, Inc.
Rochester, Minn.—Gopher Aviation, Inc.
Rochester, N. Y.—Page Airways, Inc.
Salt Lake City—Kemp & Kelsey Airservice, Inc.
San Antonio—Alamo Aviation, Inc.
Shreveport—Currey Sanders Aircraft Company, Inc.
Teterboro and East Boston—Atlantic Aviation Corp.
Topeka—Topeka Aircraft Sales & Service
Tulsa—Tulsair Distributors, Inc.
Vandalia—Ohio Aviation Co.
Van Nuys—Norman Larson Company
Wichita—Aircraftco, Inc.
Wilmington—Atlantic Aviation Service, Inc.
Youngstown—Youngstown Airways, Inc.

Qualified Service makes the FINEST *product* FINER

The Beechcraft owner can well take pride in the fact that he owns and flies one of the finest products of the Aviation Industry. He also has at his disposal the finest national service organization that is qualified by the Beechcraft factory to maintain all Beechcraft models in factory new condition.

At Certified Beechcraft Service Stations you will find skilled and efficient Beechcraft factory trained personnel, adequate equipment and facilities, factory authorized parts and accessories plus economical prices. Certified Beechcraft Service is an additional bonus you receive when you purchase a Beechcraft.

AIRCRAFTCO, INC.
New Municipal Airport
Wichita, Kansas

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ANDERSON AIR ACTIVITIES
General Mitchell Field, Milwaukee, Wisc.
Truax Field, Madison, Wisc.

ATLANTIC AVIATON CORP.
Teterboro Airport, (25 minutes from Times Square)
Teterboro, New Jersey
Logan Airport, East Boston, Mass.

ATLANTIC AVIATION SERVICE
New Castle County Airport, Wilmington, Delaware

BUTLER CO., AVIATION DIVISION
Municipal Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Mgr.
Love Field, Dallas, Texas

ELLIOTT FLYING SERVICE
Municipal Airport, Davenport, Iowa

ROD MORE AVIATION SERVICES
Cuddihy Field, P. O. Box 556,
Corpus Christi, Texas

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

J. D. REED CO., INC.
Municipal Airport, Houston, Texas

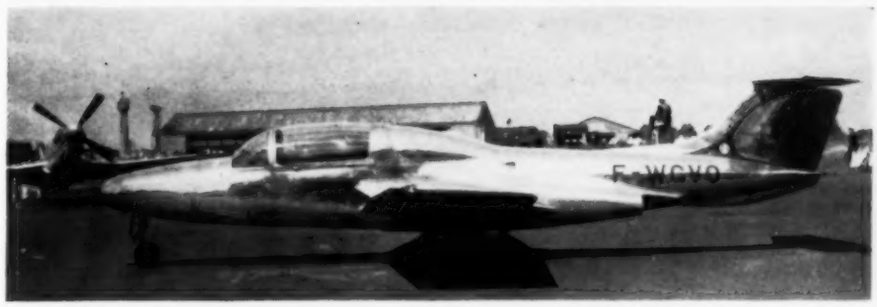
TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

WINGS, INCORPORATED
Wings Field, Ambler, Pennsylvania
Philadelphia International Airport, Philadelphia, Pa.

To obtain the best service for your Beechcraft visit the Certified Beechcraft Service Stations listed.



Aerodynamic cleanness of the M-S 760 is emphasized in this side view. All fuel and oil — 2,350 lbs. of it — is carried at or very near the center of gravity. Note horizontal stabilizer and elevator installation atop vertical fin and away from wing turbulence at very high speeds. This airplane's 400 mph. speed in France has astonished observers in view of its low power, for its two jets are rated at a total of only 1,760 lbs. of static thrust. The M-S 760 grosses 7,480 lbs. A pound of jet thrust is equal to 1 horsepower at a speed of 375 mph.
—(Morane-Saulnier Photo.)

BEECH JET

(Continued from page 20)

highly-developed piston engines currently powering U. S. lightplanes. Beech has not announced specific data for the M-S 760 but does give a clue by giving the airplane's maximum range as 970 miles at 294 mph. at 23,000-ft. altitude and with 90% of normal-rated power. This provides an endurance of 3.3 hours for that condition, or a fuel consumption of about 109 gals. per hr.

As cruising speed is increased or cruising altitude is decreased, the fuel consumption increases. For example, Beech figures for cruising speed and range, using normal rated power and including climb and letdown allowances but not providing for reserve fuel, are a 530-mile range at sea level and 350 mph., 680-mi. range at 10,000 ft. and 355 mph., and 875-mi. range at 20,000 ft. and 350 mph.

This being a twin-engine airplane and one which operates most efficiently at 20,000 ft. or higher, IFR travel would be standard procedure for it and therefore reserve fuel requirements will cut down on the mileage range available for it. Considered in this light, it represents a minimum category for the business-flying market, where a 1,200-1,500-mi. range is needed to meet IFR and traffic delay margins for 800-900-mi. trips.

But the important point is that Beech is actually entering the jet field in the business-plane market — this manufacturer knows the market well and can be expected to be an important developer. The M-S 760 has promise of greater potential utility than the figures indicate in its present configuration. Refinements and improvements are especially promising in its engines. Continental Motors, for example, can be expected to increase the Marbore power output at least 25% while holding to an increase of only about 10% in weight and fuel consumption. By the time this engine is rated up to 1,000 to 1,100 lbs. of thrust — and this should be soon — the M-S 760 will have performance far superior to its present capabilities.

It is interesting to note that the M-S 760 is almost a carbon copy of the famous Beech E35 Bonanza in payload capacity, range and cabin size. Here are the figures:

	M-S 760	Beech E35
Payload (people and baggage with full tanks), lbs.	805	797
Max. Range, miles	970	775
Cabin Width, ins.	46	42
Cabin Length, ins.	65	83
Cabin Height, ins.	48	50

But the pay-off is in the jet's twice-as-fast speed and cabin pressurization and air-conditioning. These are what will sell the successful jet business-plane in America. Such things as 350 mph. speeds and pressurization have never been achieved in the private plane field and mark the M-S 760 as a tremendous accomplishment. Considering the small engines used — totalling only 1,760 lbs. of static thrust — the M-S 760 performance is no less than amazing. It will have to be experienced to be fully comprehended.

Engine Change in 50 Mins.

It offers other remarkable features, such as the simplicity of the jet as an engine. Beech says a complete change of both engines can be made by four mechanics in less than an hour. Engine life is not known, but in other jet engines overhaul periods have been steadily extended to the point where they are now competitive with piston engines in the number of hours between overhauls. Having twice the speed, a jet airplane thus offers a reduction on the order of one-half in engine overhaul per mile flown.

Jet power simplifies aircraft operation and the M-S 760 will eliminate, for example, the need for engine run-up before take-off. Lack of vibration reduces airframe, instrument and accessory maintenance. A quieter cabin is achieved with jet power, all but eliminating an important fatigue factor.

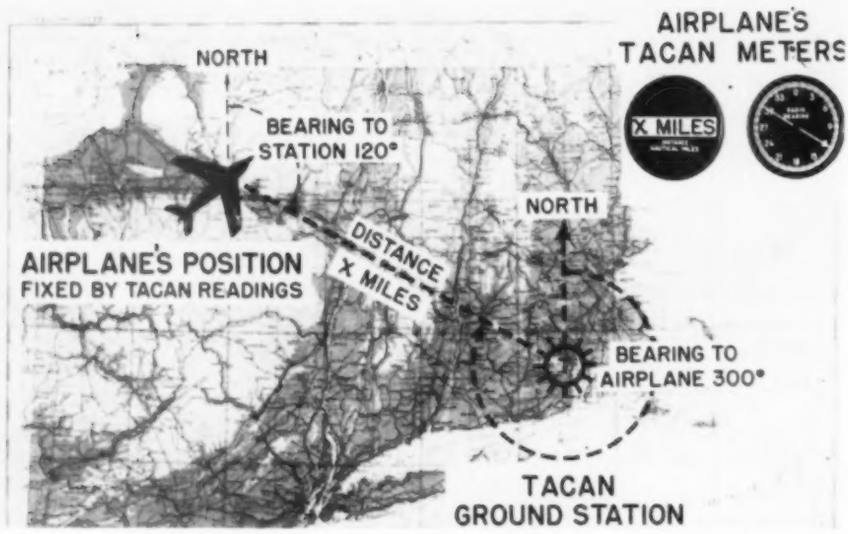
For high speeds, it has an ultimate load factor of 10, figured on the basis of 4 occupants, baggage and full main tanks. This exceeds the requirements for modern airliners which cruise at comparable speed. The French 4-place has been flown at Mach .81 "without difficulty," according to Beech, which emphasizes this as insuring a favorable growth factor for the future.

It is not, however, a "small airport airplane" in the sense of the Bonanza, for it has a take-off run of 2,500 ft. and a take-off distance of 3,550 ft. over a 50-ft. obstacle. These, however, are at a take-off speed of 105 mph., which provides for single-engine safety speed considerations. Minimum stalling speed is 95 mph., with a relatively high wing loading of 38 lbs. per sq. ft. Landing roll is 1,850 ft. and landing distance over a 50-ft. obstacle is 3,050 ft.

The Beech announcement of the arrangement for the new jet states that "experts who have flown the M-S 760 pronounce it to be an outstanding airplane in every respect." These experts were not named, but it is known that several Beech officials have been to France. Jack Gaty, vice president and general manager, visited Morane-Saulnier last September on a trip abroad. Jerry Gordon, Beech chief of design and aerodynamics, has since visited the Morane-Saulnier plant in the interests of the project.

At present, the M-S 760 demonstrator is being painted for the Beech tour in the United States and it is possible that Beech will receive the airplane in Wichita next month in mid-June.

Just how far Beech is committed on the French jet has not been divulged. All the factory announcement said was that Beech "has added to the company's trio of propeller-driven executive transports a new, 4-place, twin-jet, pressurized airplane with a high speed of 405 mph. . . . the M-S 760 built by the old-time French aircraft manufacturer, the Morane-Saulnier Company, with whom Beech Aircraft is working to bring the new twin-jet to North America for demonstrations throughout the United States and Canada this summer." However, the agreement was referred to as "Beech Aircraft's entry into the jet field of aviation" and was described



How TACAN works. ADF-type needle points to station, distance meter counts off mileage to station.

TACAN Details Revealed

INTERNATIONAL Telephone and Telegraph Corporation has revealed interesting information on the military radio navigation system, TACAN (for tactical air navigation). The Air Navigation Development Board recently advanced it as the basis for the nation's common system for both civil and military flying, setting off widespread criticism and Congressional investigation moves until the Air Coordinating Committee resolved the dilemma (see editorial, page 15).

The TACAN system was designed for the U. S. Navy by IT&T's research division, Federal Telecommunication Laboratories, Nutley, N. J. It has been under development since 1948 and still remains to be perfected.

How it works for the airman is pictured in the diagram above, which reveals the airborne set as having an ADF-type indicator which points to the station and a separate meter which counts off the mileage to the station.

IT&T reveals the airborne equipment as being small and compact, measuring only 7 by 10 by 15 inches. Weight is not given, but is said to be less than that of an airborne VOR-DME installation.

As for accuracy, IT&T says its TACAN system has an azimuth or bearing accuracy to within one degree and distance-measuring accuracy on the order of two-tenths of a mile.

Factors leading to its development were the unavailability of any other accurate and similar radio navigation aid capable of operation aboard aircraft carriers and in military theaters where time-consuming installations and site selection are ruled out, according to ANDB. However, critics have pointed out that TACAN can not transmit voice communications on the same frequency as its navigation information, as does VOR-DME equipment, and this requires additional facilities for voice. ★ ★ ★

Antenna on carrier.

Control tower antenna.

as representing the first "official knowledge of this company's research activities into the field of jet transports."

FLIGHT MAGAZINE has learned, however, that Beech obtained an "option" on the jet, reserving its decision until after 200 hrs. of flying at Pensacola to interest the Navy in a trainer order and 300-400 hrs. of flying for civilian prospects.

As of late in April, the M-S 760 in France had yet to complete official trials. However, it recently passed through the Bretigny Flight Test Center and has since received several minor modifications recommended by that center. It was then to be flown again at Villacoublay before returning to Bretigny for the official trials.

The latest figures from France on the M-S 760 give it a maximum endurance of 2 hrs. 45 mins. at a speed of 350 mph. and at an altitude of 19,700 ft. This is with a total fuel capacity of 360 U. S. gals.

The M-S 760 is the only 4-place twin-jet airplane in the world now available for demonstration. It was designed to the same specifications for a French Air Force trainer as the 2-place Fouga CM 170 Magister (described in detail in this magazine last month). But the latter, which features tandem seating instead of the M-S 760's side-by-side seating, was the winner of a production contract. A British magazine, "Aeronautics," recently reported the cost of this trainer design for the first 100 aircraft will be 30,000 pounds ($84,000) including radio and instruments (but not armament).

Its first flight was made by the M-S 760 on July 29, 1954. The design, however, originated as the M-S 755, known as the "Fleuret," a 2-place, side-by-side jet trainer which made its first flight on January 29, 1953. The prototype made many flights and demonstrations in 1953, including 100 hours of flight tests under tropical conditions in India.

While exploiting the 2-place Model 755, Morane-Saulnier decided at the end of 1953 to construct a 4-place version. This was done by the simple process of adding 13 inches to the fuselage length ahead of the wing, allowing two additional side-by-side seats to be installed. With this modification, the company began demonstrations of its versatility as a high-performance liaison and staff air taxi aircraft and began to attract foreign interest as the first of its kind in the world. It is also offered as a naval trainer, for which an arresting hook would be fitted for carrier landings.

★ ★ ★

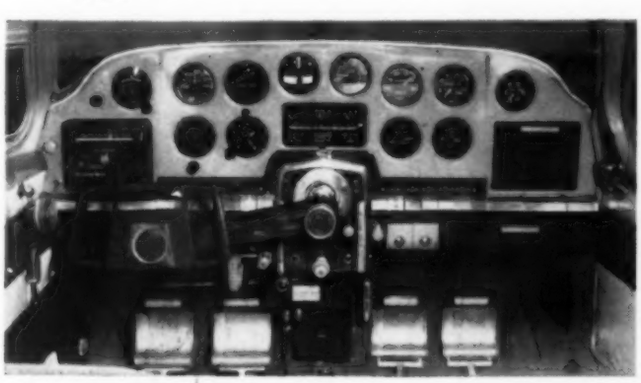
THE NEW MODEL F35 BONANZA FOR 1955

The greatest VALUE *on the market today*

. . . the 1955 Bonanza has been refined to matchless perfection and from any angle it's the finest, most practical design in a personal plane. The new Bonanza for 1955 offers speed **with** safety . . . power **with** ease of flying . . . all-metal durability **with** roomy comfort and combines many other advanced design features that make it years ahead in its field. The 1955 Bonanza is truly the greatest value on the market today.

★ With a cruising speed of 175 mph to 184 mph (depending on engine installed), the Model F35 Bonanza delivers *speed* but retains low fuel consumption of about 10 U. S. gallons per hour.

★ Built to carry efficiently a useful load of 1,053 pounds, with full tanks, there's plenty of available weight allowance for four people and baggage.



Complete instrumentation, arranged for maximum flying ease and efficiency — plus provision for easy installation of additional instruments.

Some of the New Features for 1955

A NEW Additional Window on each side provides even greater visibility, greater safety, and greater comfort.

ADDITIONAL Fuel Wing-Tanks, exclusive in the F35 Bonanza, provide ten more gallons of fuel in each wing. When installed, they provide greater range without loss of baggage space.

NEW Posture-Ease, Adjustable Seats for the Bonanza provide *the tops* in comfort for all passengers.

COMPLETE Exterior Painting is an exclusive standard feature of the Bonanza. The new F35 designs are offered in a wide array of attractive, durable and easy-to-see colors.

NEW Interior Styling for the 1955 F35 Bonanza provides the ultimate in design, quality of materials and workmanship.

J.D. REED CO. Inc.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS

Owning a Beechcraft is a paying proposition. We invite you to let the J. D. Reed Company prove it with facts, figures and a demonstration. A phone call or letter on your company letterhead will bring complete details.

AIR REPORT

(Continued from page 10)

They were presented by C. W. Lefever, AHS awards chairman. Honorary fellowships went to Commander William G. Knapp, Navy anti-submarine warfare project officer, and to Anton Flettner, president of the pioneering Flettner Aircraft Corp.

FIRST CASH AWARDS FOR OUTSTANDING BUSINESS PLANES will be given June 4 by Reading Air Service at its annual one-day operations and maintenance clinic at Reading, Pa. Cash prizes total $6,000 and plaques will also be given. Classes are single-engine and multi-engine up to 12,000 lbs. and multi-engine over 12,000 lbs., with prizes for best exterior, best interior, best equipment and instrumentation presentation and best of class.

A SUPER-46 VERSION OF THE CURTISS C-46 is being demonstrated in Washington, Teterboro and Miami after flying nonstop from Burbank to Washington at an average speed of 232 mph. It is a re-worked prototype of the Aircraft Engineering Foundation's modification program, sponsored by 26 airlines operating C-46 transports and headed by Monte H. Snedeker.

CESSNA'S TOP DEALER FOR 1954 WAS DAL-TEX AVIATION IN DALLAS, with $317,575 in sales including 21 new planes and 31 used planes. H. O. Wright, president of Dal-Tex, received a plaque from Eldon Bloyd, regional Cessna sales manager. ★ ★ ★

THIRTEEN BUSINESS PLANES CARRYING 53 GOODWILL TRIPPERS last month inaugurated a unique "howdy neighbor" project at Abilene, Texas, providing airlift to Abilene, Kansas, for the civic undertaking. Pilots taking part included (left to right) George Paxton, Sam Jennings, Jack Hughes and L. J. Hall, all of Abilene, Texas.
—(Abilene Reporter-News Photo.)

ACTIVITIES OF MISSOURI PILOTS ASSOCIATION AND ST. LOUIS NAA CHAPTER recently included two "institutes" for pilots, held at the Naval Auditorium at Lambert Field, St. Louis. Part of the audience at one of the Institutes is pictured above.

FIRST AVIATION SPARK PLUG GRADUATING CLASS is pictured at the recent "college" sponsored by the AC Spark Plug Division of General Motors. Left to right, they are: Front Row — Henry Hutchison, Airwork; W. Carney, Van Dusen Aircraft; Bobby Jackson, Southwest Airmotive; A. Jettner, Airwork; C. Truman, Southwest Airmotive; George Schaver, Pacific Airmotive; V. R. Knudson, Standard Aero Engine (Winnipeg). Second Row — Bill Tyson, Van Dusen; B. Gale, Airwork; Sig Gudmundsen, Van Dusen; R. Scott, Airwork; H. W. Grant, Standard Aero Engine; H. A. Smith, Pacific Airmotive. Back Row — Ed Nail and Ray Vail. Pacific Airmotive; Jack Sherman, Southwest Airmotive; Skip Lance, Pacific Airmotive; F. A. Jones, Standard Aero; W. L. Walsmith, Southwest Airmotive; Jack Craig, Pacific Airmotive; and Paul Kennedy and Jim Briley, Southwest Airmotive.

Airmen's Calendar

May 18-19—ANDB Technical Symposium on Common System Radar Beacon, Washington, D. C.

May 21—Armed Forces Day Air Celebration, Municipal Airport, Birmingham, Ala., with Banquet at Tutwiler Hotel at 7 p. m.

May 21-22—Open House for ARON: Annual Remaining Overnight for Civilian Aircraft Owners, Sponsored by Lockbourne Chapter of SAC Aero Club, Lockbourne Air Force Base, Columbus, Ohio (for permission to land, write ARON, LAFB, Columbus 17).

May 30-June 4—Aviation Writers Association Annual Convention, King Edward Hotel, Toronto.

June 4—1st Canadian International Air Show, Toronto.

June 4—6th Annual Reading Air Service Maintenance and Operations Meeting, Reading, Pa.

June 9—6th All-Women's International Air Race, Washington, D. C., to Havana, Cuba. Entry chairman is Miss Dorothea Vermorel, Florida, Chapter of 99's, 1015 Olympic Building, Miami, Fla.

June 12—Pilot's Proficiency Test, Graham Field, Route 8, Butler, Pa. (June 19 is rain date).

June 13-14—WNAA Skylady Derby, Little Rock, Ark., to Raton, N. M., $600 in prizes. Mrs. Ruth Nickell, 904 Nickell Road, Tulsa, is entry chairman.

June 18—Annual Fraternity of the White Heron Fish Fry and Fly-In, Anahuac, Texas (to join White Herons, write Guy C. Jackson, Secretary, Anahuac, Tex.)

June 18-25—3rd Annual Transcontinental Air Cruise, Sponsored by Philadelphia Jaycees, Palm Springs to Philadelphia.

June 21-24—25th Annual ADMA Meeting, Breezy Point Lodge, Brainerd, Minn.

July 2-6—9th Annual All-Woman Transcontinental Air Race, Long Beach, Calif., to Springfield, Mass., sponsored by the Ninety-Nines, Inc. Entry chairman is Mrs. Barbara London, 624 Armando Drive, Long Beach 7, Calif.

July 3—2nd Annual Western N. Y. Air Show & Races for Midget Planes, Dansville, N. Y.

STOP FOR SERVICE UNDER THE HUMBLE SIGN

Look for the familiar Humble Esso sign at take-off or destination—it's the sign of dependable products for your aircraft.

Humble Esso fuels and lubricants are continuously improved by continuous studies of aviation requirements.

The Humble Esso sign at your airport is your assurance of top operating performance from your plane's engine.

HUMBLE

ESSO AVIATION PRODUCTS

- Use your Humble Credit Card at more than 600 airports across the nation.

HUMBLE OIL & REFINING CO.

Always Ready To Go

Hundreds of Cessna owners all over the country depend on the Authorized Cessna Service Stations listed below for their transportation needs—Authorized Cessna Service is their assurance that business planes are always ready to go, always in top condition for reliability, performance and comfort.

Every Cessna owner is guaranteed three important things by our factory-supervised Cessna Flat Rate Service:

(1) You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

(2) You get genuine Cessna parts and factory-trained workmanship.

(3) You save money and time and we stand behind every job for your fullest satisfaction.

To make the most of your Cessna's usefulness, visit the Authorized Cessna Service Stations listed below.

These progressive Cessna Authorized Service Shops offer flat-rate service.

Aircraft Sales Company
Meacham Field
Fort Worth, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
Municipal Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Howard Aero Service, Inc.
San Antonio International Airport
San Antonio, Texas

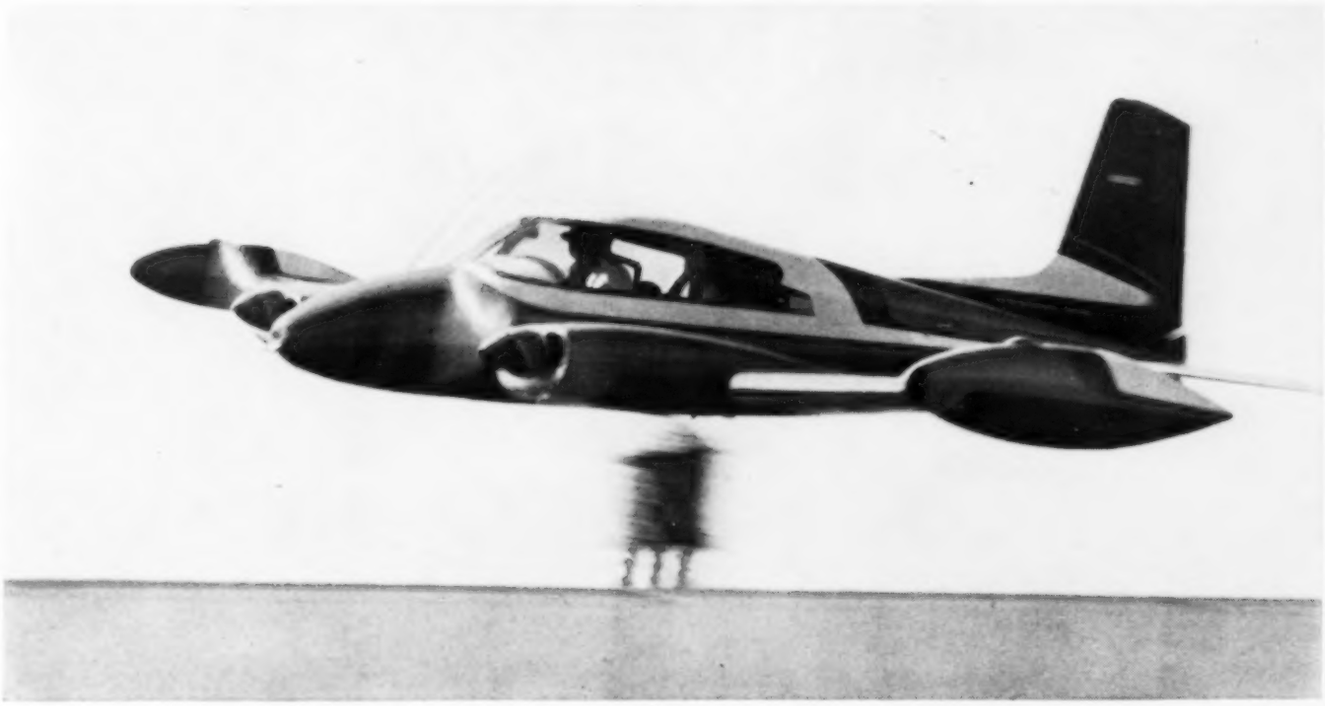
Ragsdale Flying Service
Municipal Airport
Austin, Texas

Southwestern Skyways, Inc.
New Municipal Airport
Santa Fe, New Mexico

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

NEWEST, FASTEST EXECUTIVE TRANSPORTATION . . . cruises over 205 m.p.h. . . . climbs 380 ft. a minute on just one engine . . . streaks 1,000 miles non-stop . . . yet costs much less than any comparable airplane – only $49,950!



Great New Cessna 310

Fastest of all executive twins, brings dozens of design "firsts," totally new standards of luxury and performance to business flying. Leader in its class, this swift, luxurious all-metal twin costs only $49,950! Cessna's sleek, new 310 seats five in airline comfort, has wing-tip fuel tanks, large split-type flaps, fully retractable tricycle landing gear and many other important features. For information, see nearest Cessna dealer (listed in yellow pages of phone book) or write CESSNA AIRCRAFT CO., DEPT. FM-5, WICHITA, KANSAS.

Wing Tip Tanks

The first offered as standard equipment on any twin airplane! Two 50-gal. tanks keep fuel safely away from cabin and nacelles, increase lift, cross-feed to either engine. "Trimming out" is easy, even with one tank empty.

Full Comfort for Five!

Foam rubber seats—adjustable and over 4 ft. wide in back, adjustable and reclining in front! Wide (40 in.) door offers easy entrance to front or rear of cabin. Four striking exterior color combinations with matching interiors. Large heating-ventilating system with 8 outlets and defroster. Wide, shock-mounted panel takes maximum combination of instruments and radios. Spacious shelf area. Large luggage compartment is easily reached through cabin or outside door.

Fastest Because It's Cleanest!

Flat nacelles are only 21 in. deep! Powerful 240 h.p. slow-turning engines with all-metal constant speed, full feathering props, added thrust gained from exhaust augmentors. Waist-high engines, easily serviced.

Cessna

CESSNA 170 180 195 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED!

Exterior view shows the big windows, measuring 16 by 19 ins., which have more than doubled the Beech D18 window area in the Remmert-Werner custom conversion.

—(Remmert-Werner Photo.)

Custom Beech Conversion

BILL Remmert, whose success in custom aircraft conversions for executive fliers is advertised by scores of Super-92 Douglas DC-3's in corporate use all over the country, has come up with an interesting big-cabin, big-window conversion for the popular Beech D18 twin.

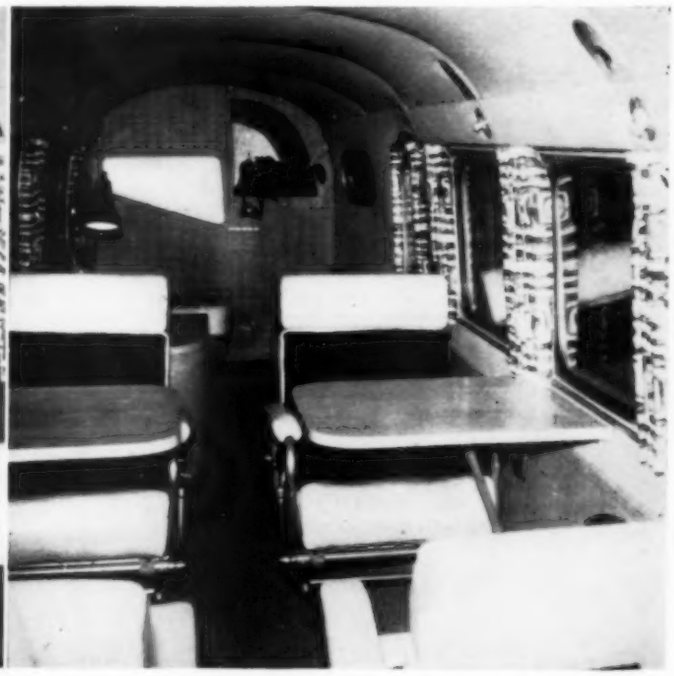
In a complete modification of the Beech, his Remmert-Werner shops at Lambert Field, St. Louis, give the Twin a roomier cockpit and a more spacious cabin with seating for five passengers and two crew. Window area is more than doubled, with 8 large 16 by 19-in. picture windows and two 10 by 14 windows.

Special chairs add to the cabin roominess and both forward and rear bulkheads have been re-worked, the rear one being moved farther rearward and replaced by a disappearing lavatory screen while the front one has been modified so that the cockpit virtually becomes a part of the cabin, although its accordion-type door can close it off when desired.

A fitted snack bar includes thermos bottles, drain, ice chest, hot cup, glasses, dishes, silverware and bottle storage. ★ ★ ★

New type chairs are used in the cabin of the Remmert-Werner custom Beech conversion. Photo at left looks forward, showing accordion-door cockpit entry. Photo at right looks rearward and shows re-located bulkhead beyond door. Photo above shows snack bar.

—(Remmert-Werner Photos.)



Announcing the Formation of the NATIONAL PILOTS ASSOCIATION

open to all pilots—private, business, airline, military

Out of a long-felt need for a truly democratic organization of pilots representing all segments of the flying fraternity, has emerged the National Pilots Association, Inc.

★ ★ ★

NPA, now with headquarters in New York, will soon have a full staff and office in Washington to represent the particular interests of all who fly aircraft.

NPA will help give added representation to that already in effect, to combat any encroachments on our rights as pilots to use the airspace. This much-needed pilot's organization, operating in a democratic manner, will give added weight and forcefulness to the efforts already undertaken by various other organizations.

In addition, NPA plans an active program of aviation development to encourage the use of aircraft for business and pleasure. It hopes to sponsor national, regional and local flight activities — tours, navigation and efficiency contests. It will work closely with the National Aeronautic Association which is the official USA representative of the Federation Aeronautique Internationale, the world-wide governing body of sporting aviation.

NPA will refrain from profit-making operations such as insurance sales, premiums, magazine subscriptions and cut-rate merchandise offers. NPA will work with and not against manufacturers and operators. NPA will have an annual meeting open to all members at which officers will be nominated and elected in a truly democratic manner.

NPA's Founders

NPA was instigated by some of America's best-known and most active pilots in all spheres of aviation activity. Originators include:

Robert N. Buck, Captain, TWA, International Division. Former Transcontinental record holder and well known writer. (1st VP of NPA)

Leighton Collins, Editor and Publisher of Air Facts magazine. (2nd VP of NPA)

B. Allison Gillies, San Diego, Calif. Well known private pilot of 31 years experience. (Director of NPA)

George Haddaway, Editor and Publisher of Flight magazine. (Director of NPA)

Dwight P. Joyce, President of The Glidden Company, Cleveland, Ohio, private plane owner for many years. (President of NPA)

A. Paul Vance — Monsanto Chemical Corp., St. Louis. (Director of NPA)

William J. Junkerman, veteran Naval pilot, well known aviation attorney. (Secretary of NPA)

George Galipeau, Amherst, Mass., Vice President, Van Dusen Aircraft Supplies, private pilot of 20 years experience. (Treasurer of NPA)

Why You Should Join NPA

NPA is an organization for all pilots, a place where they may solve their mutual problems, and together advance their flying interests. It also will operate in fields now neglected for the betterment of flying.

If you are a pilot seriously interested in aviation, whether student, private, business, commercial, airline or military, you are eligible for membership in NPA. You will find the service rendered more than worth the moderate membership fee. Why not fill out the attached application blank and forward to NPA headquarters? You will promptly receive your NPA membership credentials, and start receiving the club's valuable information bulletins.

MEMBERSHIP APPLICATION

NATIONAL PILOTS ASSOCIATION, Inc.

I hereby apply for a Membership and enclose my check for $10.00 to cover such membership and first-year dues.

My CAA Ctf. No. is:_____ Class:_____
(ATR, Comm'l, Pvt., Student)

Ratings:_____

I fly a_____ Owned by_____
(Make & Model Airplane)

I soloed_____ 19____ Approx. time to date:_____ hours.

(Please type) NAME_____

STREET_____

CITY_____ ZONE____ STATE_____

Signature:_____

Date:_____

MAIL TODAY to NPA, Suite 1403, 52 Vanderbilt Ave., New York 17, N. Y.

Mr. Fixed-Base Operator:

REDUCE YOUR PARTS INVENTORY, INCREASE OPERATING EFFICIENCY . . .

by calling the Bendix Distributor nearest you!

The services of authorized distributors handling parts and units for Bendix* carburetion systems or landing gear equipment can mean a great deal to fixed-base operators.

For by buying through the nearest Bendix Distributor, fixed-base operators can reduce inventory—eliminate follow-up costs—economize on transportation—keep obsolescence at a minimum—reduce product deterioration, insurance, storage space and taxes.

Sounds like a lot to promise, but if you will get in touch with your nearest Bendix Distributor, he will be glad to demonstrate just how the program works.

*TRADE-MARK

BENDIX PRODUCTS DIVISION **SOUTH BEND, IND.**

Airwork Corporation
Miami, Florida

Airwork Corporation
Millville, New Jersey

Aviation Electric Ltd.
Montreal, Canada

W. J. Connell Company
Newton Upper Falls, Massachusetts

General Aircraft Supply Corporation
Detroit, Michigan

Pacific Airmotive Corporation
Burbank, California

Pacific Airmotive Corporation
Oakland, California

Pacific Airmotive Corporation
Kansas City, Kansas

Pacific Airmotive Corporation
Seattle, Washington

Southwest Airmotive Company
Dallas, Texas

Standard Aero Engine Ltd.
Winnipeg, Canada

Standard Aircraft Equipment Co.
Mineola, Long Island, New York

Van Dusen Aircraft Supplies
Minneapolis, Minnesota

Struts, wheels, brakes and Cermetallic brake lining.

Injection and float-type carburetors, direct fuel injection systems.

THE NAME Bendix AVIATION CORPORATION MILLIONS TRUST

THUNDER-BUSTER

(Continued from page 21)

give indication of results. A report by the Great Western Sugar Company, for example, shows beet acreage activities in the Scottsbluff area as follows:

	Number of Hail Storms	Total Acres Damaged
1951 (No Hail Control)	9	42,000
1952 (No Hail Control)	7	34,000
1953 (With Hail Suppression)	9	14,000
1954 (With Hail Suppression)	11	14,000

Figuring at 14 tons of beet yield per acre, the reduction in hail damage has meant an annual increase in production of 392,000 tons. Only a fraction of this would pay for hail suppression.

A thunderhead is a weather factory in which the release of energy from heat or condensation is so tremendous as to bear similarity to the energy release in atomic explosions. Authorities have testified that the energy release in a small thunderstorm actually equals the energy of several atomic bombs. Similar nuclear reactions are involved.

But weather modification through induced cloud nucleation has not been as thoroughly developed as has atomic energy — weather modification is now in an earlier stage of development than was atomic energy in 1946 when the Atomic Energy Commission was created. However, Dr. C. G. Suits, General Electric vice president and research director, told a Senate committee studying weather developments that the *"fundamentals of weather modification methods are well known and do not require the employment of*

A special burner for silver iodide was engineered for Jim Cook's Mustang at Dallas Aero Service in Dallas with Surface Combustion's Janitrol heater experts participating. That's Pilot Cook in the farm hat, watching Tom Lombardo of Dallas Aero Service work at the heater installation. —(Dallas Aero Service Photo by Ed Miley.)

If your product is sold to the Aviation Industry..

here is the medium to reach a dynamic MARKET

The ANNUAL LOCAL SERVICE AIRLINE EDITION, published by FLIGHT MAGAZINE each year in the JUNE Issue, is recognized throughout the Aviation Industry as the only published source for authoritative and complete detailed information on operations of each of the fourteen local carriers.

Every branch of the Aviation Industry will focus its attention on this significant presentation. Here, then, is the opportune place to be represented with your advertising sales message. The JUNE 1955 issue of FLIGHT MAGAZINE is the **ONLY MEDIUM** that can offer 100% penetration of this lucrative expanding market. Make your space reservation today in this edition for increased sales in the months to come.

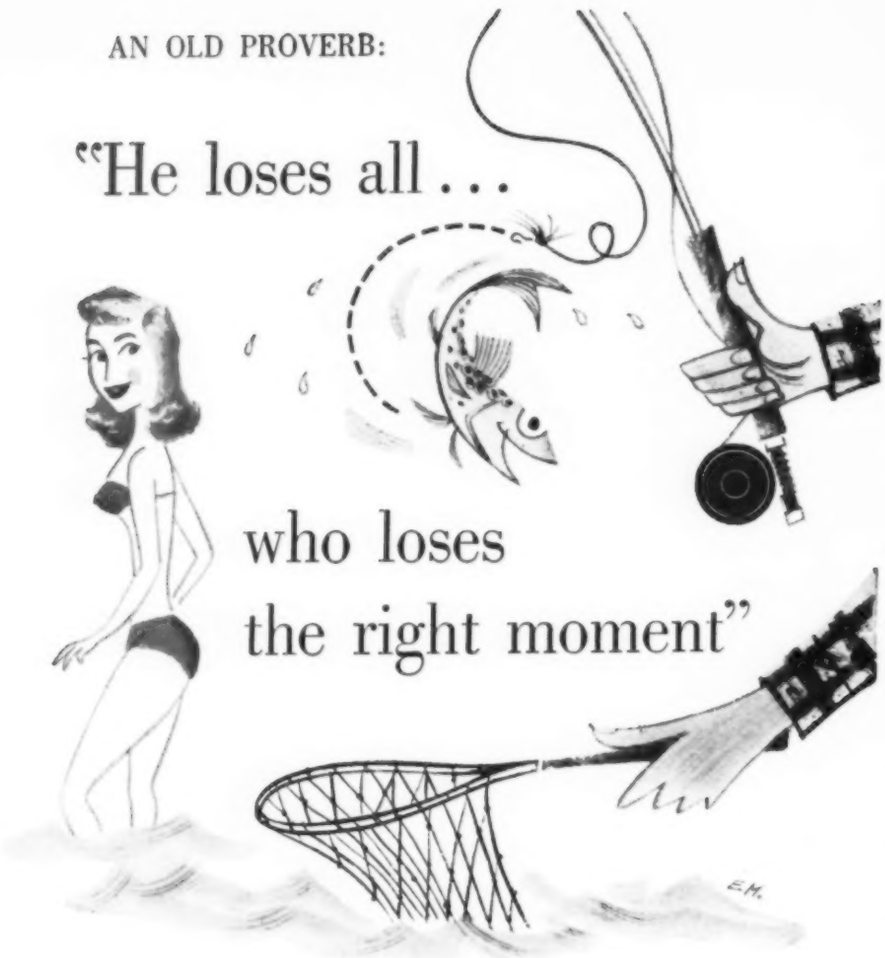
FLIGHT
MAGAZINE

ALLEGHENY AIRLINES
BONANZA AIR LINES
CENTRAL AIRLINES Inc.
FRONTIER AIRLINES
Lake Central AIRLINES
MOHAWK Airlines Inc.
NORTH CENTRAL AIRLINES INC.
Ozark Air Lines
PIEDMONT Airlines
Pioneer Air Lines, Inc.
Southern Airways, Inc.
SOUTHWEST AIRWAYS
TRANS-TEXAS Airways
WCA WEST COAST AIRLINES

Box 750, 1901 McKinney Ave.
Dallas, Texas

AN OLD PROVERB:

"He loses all...



who loses
the right moment"

This is a good time to consider whether or not the moment has come for you to make the change in your employment that can mean the beginning of a successful, productive and happy future.

Opportunities are outstanding right now at Fairchild Aircraft Division, for experienced aerodynamists and designers looking for interesting, provocative work in the forefront of aviation design, research and development.

Take stock of your present job. See whether you wouldn't rather have the kind of progressive, active and interesting job that Fairchild is offering to the right men.

Send your resume today to Walter Tydon, Chief Engineer.

ENGINE AND AIRPLANE CORPORATION
FAIRCHILD
Aircraft Division
HAGERSTOWN, MARYLAND

"where the future is measured in light-years"

highly trained personnel for their use."

Pilot Jim Cook and his work with hail are but one example of how these fundamentals have been put to use. Cook has benefitted from voluminous GE and other studies on the processes involved and has corresponded with Dr. Bernard Vonnegut, a GE scientist credited with discovering the cloud nucleation possibilities of silver iodide. This material is known as an excellent agent for experimental meteorology — dry ice and other agents have short life but silver iodide continues its activity for longer periods (direct sunlight shortens its life but cloud cover protects it from direct rays).

Cook doesn't pretend to be a scientist or "expert" on theories. All he does is use methods which have been proved time and again. In explaining his operation, he emphasizes that while he may be talking about and employing scientific matters, he is plain Pilot Cook, an aerial applicator, even though he may sound like a scientist to some people.

"A thunderhead contains supercooled moisture above the cloud's freezing level," he explains. "Certain kinds of agitation will trigger the freezing of this supercooled moisture—high-velocity turbulence such as generated by airplane propeller tips and wing tips can be seen doing this. Also, particles of matter can trigger the freezing process when conditions such as temperature and moisture are right.

"The particles I use are silver iodide. I dissolve silver iodide in acetone and I burn this solution, releasing the products of combustion into supercooled

Controls for Jim Cook's silver iodide generator in the Mustang include (left to right) a Navion vernier for ram air, knob for silver iodide volume, pressure and compartment heat indicators, and knob for burner fuel volume. Dallas Aero Service made the special panel and controls installation. "DAS has expert engineering services for special installations and are good people to work with," said Cook.
—(Dallas Aero Service Photo by Ed Miley.)

clouds. Each small particle of silver iodide is capable of causing supercooled moisture to freeze upon contact with it in the geometrical form of a snowflake or ice crystal. Motion contacts more moisture and the crystal grows — seeding is thus achieved. As the crystals grow, they become heavier and fall as snow, hail or rain.

"By controlling the quantity of induced particles or seeding, I can create a large number of small crystals or droplets and prevent the cloud's moisture from converting into a relatively fewer but larger units, such as heavy hailstones. The smaller ones are less damaging. I call it hail suppression, which it literally is."

Cook says he can do something else, too. With the right conditions, he can keep the droplets so small that nothing happens and, in effect, the top of the thundercloud is knocked off — its moisture just floats away on the wind.

There are much more detailed and complicated factors involved in hail suppression, but the big key to the whole process is the cloud's freezing level. In the area where he works, this level is usually at about 16,000 ft. It takes, he says, about 12,000 ft. of vertical thickness of supercooled moisture inside the thunderhead to generate heavy hailstones.

"If I can cut the cloud's 12,000 ft. of thickness above the freezing level down to something like 9,000 or 10,000 ft. of thickness, I can keep that cloud from generating heavy hail," Cook says.

This means high-altitude flying. Cook figures he will be working mostly at 28,000 to 35,000 ft., penetrating there to sow his silver iodide seed in a number of passes straight through the thunderhead. That level is also a region a great turbulence, to put it mildly. There is no such thing as a "small" thunderhead which reaches 30,000 ft. Any at that height are popping pretty wildly from tremendous concentrations of condensation inside, breeding not only hail and murderous lightning bolts but vertical winds with velocities of 300 mph. and more in both up and down directions, shear fashion. The blue yonder is wildest where the thunder-buster works.

Most of his work is in the afternoon hours. The hail season stretches over parts of five summer months, May to September. He averaged about 175 hours flying his first season in 1953 and 232 hours in the 1954 hail season. This year he expects to log about 250 hours at it. Each trip up to a thunderhead involves about 1½ hours of flying. Total

ONE STOP DOES IT...

It takes a lot of fully-equipped, expertly-staffed facilities to serve all your flying needs and Gray Aircraft Service has acres of everything it takes for specialized Beechcraft service to satisfy you.

The roof over our heads covers 80,000 sq. ft. of floor space in the buildings sketched above by our artist. That's the equivalent of the floor area in 80 homes.

It takes all this to adequately meet your requirements — and we keep every square foot busy all the time. Our craftsmen are Beech specialists and use factory equipment in 19,054 sq. ft. for our engine, instrument, paint, parts and office departments; 13,950 sq. ft. for our radio, autopilot, electronic, accessory overhaul, upholstering and sales departments, and 46,874 sq. ft. for 41 specially-engineered storage units housing customer Beechcrafts on our concrete ramp.

Many years of Beech know-how and specialization make our facilities a valuable asset for your flying needs — all personally supervised by D. A. Cody to guarantee your satisfaction. Take advantage of our top-notch services on your next visit to Love Field in Dallas.

CALL ON GRAY FOR BEECHCRAFT RADIO AND AUTOPILOT INSTALLATIONS

DISTRIBUTORSHIPS

GOODYEAR LYCOMING
CONTINENTAL LEAR

DEALERSHIPS

BENDIX NARCO ARC

D. A. Cody, Mgr.
EL-3245
Irving 2-1265

CERTIFIED BEECHCRAFT SALES & SERVICE

Gray Aircraft Service Co., Inc.

LOVE FIELD DALLAS

"burner" time on a trip is about 30 minutes inside the thunderhead — the rest of the time is going to and from the cloud.

Cook's biggest problem is his burner for the silver iodide. He has tried numerous other methods. Dry ice was fairly simple to seed with but he found liquid CO-2 even better. Once he even used plain water, dispensed from an ordinary spray plane beneath a thunderhead, the updrafts carrying the water into the cloud to do its work. Others have successfully used plain salt. But silver iodide is the most effective agent. Corrosion and keeping the flame going at altitude are about as difficult as metering the right amount of silver iodide. How it is accomplished is something Jim wants to keep to himself, at least until he has it perfected.

He first experimented with a BT trainer. A Stearman sprayer was next and by then Cook learned he had to get more altitude for better results. He bought a Curtiss P-40 and did his first contract work in it, replacing it the next year with a twin-engine Douglas A-20. But he was still not getting up where the biggest results could be attained, so he bought a North American P-51 Mustang. He will put it to work this summer for the first time.

"I can get to 35,000 ft. without too much trouble," Cook said. The Mustang was bought from Joe de Bona, who won a Bendix trophy in it and who set a transcontinental speed record by flying it from Los Angeles to New York in 4 hrs., 24 mins. to average 561 mph.

An idea of Cook's problems at his new working altitudes can be had by considering the flying conditions he faces, without going into the complications of cloud nucleating and weather modification. While a Mustang is a great airplane, it is anything but a comfortable "office." Its small cockpit cannot be adequately ventilated or cooled — Jim will be literally sweating in his cockpit's heat from the big Rolls Royce engine up front, its exhaust flooding by without letup. Even in wide-open blue sky, 35,000 ft. is a long way up from a standpoint of altitude effects on the human body. Cook has a large supply of oxygen but it also takes pressurization for ideal conditioning at such a level, and the Mustang has no pressurization. Inside the turbulence of a thunderhead, his single-engine, solo flying problems are compounded to an extent nobody can comprehend without experiencing them personally.

While he has two seasons of thunder-

YOUR BEST BET in HOUSTON

Smiling Service for the Plane and we Pamper the PILOT, too

CITY OF HOUSTON

San Jacinto Monument
Biggest Shaft in Texas

ANDRAU RADIO 269 AAP

ANDRAU AIR PARK

at Alief, Texas — 15 Miles Due West of Downtown Houston

TRANSPORTATION ALWAYS AVAILABLE

Bob

Welcomes You

Stop in and See us on Your Next Trip

- Hangar and tie-down space available
- Transportation available to Houston and Shamrock Hotel
- 80-91 octane gasoline
- Unicom
- Coffee Shop
- 22 miles on 283-degree track from Houston LF range
- Low frequency homing beacon 269 Ky AAP
- Runways: hard surfaced, lighted, and rotating beacon, 3450 feet
- 24 hour operation

Bill Pierce 'lying and Ed Tucker of GASCO are Prairie Dogging it.

bustin' behind him, Cook says most of his flying has been inside thunderheads down around the 18,000-20,000 ft. level.

"I've been in a lot of turbulence, all right, but I honestly believe there are airline captains who can recite worse experiences in storm clouds than I," Cook modestly explains. The turbulence he has been in has wrecked an average of about 5 gyros a year. Last year, he encountered one severe updraft which so overloaded the wing of his A-20 that it caused a high-speed stall at 190 mph. indicated reading and the airplane wanted to spin out — he had slowed down in the turbulence and actually had the throttle just about closed. His airplane has been in hail which left its aluminum skin marked as if splattered with .22 slugs, the hail having the same effect by smearing the alclad.

His big hope at the moment is the new burner he has devised and which Dallas Aero Service at Love Field in Dallas has installed, neatly packaged in the engine compartment.

Whatever Cook has netted from his thunder-bustin' he has plowed back into his equipment. In fact, he is equipment poor, having a P-40, A-20 and P-51. But he also has acquired valuable background and an operating technique.

Meanwhile, the ex-airline pilot, executive flier and crop duster believes the military services, or the Air National Guard, could do some thunder-bustin' on their own as a public service, knocking out the tops of storm clouds before they breed tornadoes. "They have all the equipment and the fundamentals are well known," says Cook. "I am convinced weather modification can protect the public from destructive storms. But it is too big for me as a single individual."

The important thing, the thunder-buster believes, is that the airplane is capable of workaday applications which can serve man's best interests as well as his war-making potential.

"A thunderhead packs more wallop in energy release than several atomic bombs," Cook points out, "but I have tamed many a thunderhead merely by flying into it briefly." That, we'll say for Jim, is quite an accomplishment for an airplane, and especially for the ambitious country boy from Texas who's doing it, single-handed, and is getting paid for it. ★ ★ ★

The Remmert-Werner

CUSTOM 18 conversion

Here is a completely new design for comfort and relaxation that you'll have to see — a small ship version of the famous Remmert-Werner Executive DC-3, with as many of its features as we could pack into this already popular airplane. While conversion is in progress on your plane, you may also have, according to your desires, complete overhaul for airframe, engines, tanks, surfaces, wings, electronics, radios, and other components.

big, easy vision windows
special reclining chairs
adjustable headrests
spacious interior

roomy cockpit
open design
clean, modern lines
bright, restful, decor

Write for an estimate today, and see what a little imagination and experience can do for your air travel comfort.

— and another new

SUPER-92 DC-3—N41F—ready in May

Super-92 engines, Collins or Bendix radio, new ship guarantee, complete 8,000-hour overhaul, beautiful custom interior, big windows, 200 mph.

In Fort Lauderdale call
JAckson 3-2950
(Our southern exposure)

REMMERT-WERNER, Inc.

PErshing 1-2260 Lambert Field St. Louis, Missouri

JUST AMONG OURSELVES

(Continued from page 15)

minimum amount of TACAN necessary to meet tactical requirements. Installations must avoid interference with Radar Safety Beacon and DME.

2. Proposed use of TACAN must be coordinated through the ACC agencies, and aircraft flights based on the system must be capable of being integrated into the operation of the Federal Airways to minimize operational conflicts.

3. CAA will continue the VOR/-DME system until some succeeding common system has been adopted and installed on the Federal Airways system.

4. All agencies involved in present or future systems will consult with all other agencies through the ACC. Any implementation of DME will be carried out only in proper priority relationship to the other needed improvements in the system.

5. If TACAN is adopted for use ultimately, VOR will be continued until 1965 and DME through 1960.

The Air Navigation Development Board was also charged with three priority studies for recommendation to the ACC. First, presently undetermined factors such as the actual number of non-interfering channels available to TACAN; number of TACAN channels required for common civil/military system and for the interim tactical system; the relationship of TACAN to the continental air defense plans; plan and direct a program to complete the development of TACAN for possible common system use. Second, studies to determine technical feasibility of an alternate Rho-Theta System which might meet the stated common system requirements. Third, ANDB should determine the feasibility of improving low altitude coverage and minimizing site preparation of the VOR/DME; coaxial co-location of the VOR and TACAN antennas and the VOR/-DME and TACAN antennas; and converting civil DME ground equipment to serve as low powered TACAN terminal facilities.

Let us all hope this will bring peace to the Federal Airways system and that all agencies involved, civil, military and governmental, will pull together in the same harness. Some skeptics believe that the ACC policy will result in two different systems, one for civilians and one for the military. The most pessimistic take the view that should this be the result, the military will pull out its historical support of CAA appropriations for the common system now in use and that a use tax of from $3,000 to $5,000 per civilian airplane would have to be imposed to make the civil system self-sustaining.

Surely such a tragic turn of events can be avoided by everyone working together. It is now clear that the Air Coordinating Committee, in directing the Air Navigation Development Board to proceed as outlined above, has the tremendous responsibility of guiding the search for a system of air navigation acceptable to all concerned to the end that the best interests of the nation be served with a minimum of dislocation to any category of user and at a minimum cost to the taxpayer.

We think the ACC can handle that responsibility, the best proof being in the moderate compromise worked out in what looked to be an almost impossible stalemate a few weeks ago.

TOM FAGAN

WHO said a prophet is without honor in his own country? That old saw doesn't apply in the case of Thomas Z. Fagan, who, for thirty years has been one of the mainsprings of the universally known Scintilla organization at Sidney, New

finest to

SOUTH AMERICA

and to 52 cities inside U. S. A.

Whether your mission is business or an unforgettable vacation, Braniff will get you there with the ideal combination of speed, dependability and luxurious comfort. To South America, fly El Conquistador, Braniff's deluxe DC-6; or save up to 25% on excellent but economical DC-6 tourist flights. In Braniff's Mid-America you'll enjoy your flights in superb DC-6 and Super Convair planes. And on all flights, million-mile captains and Braniff's gracious hospitality that's the talk of two continents.

Along Braniff's routes lies magnificent Rio de Janeiro — just one of the Latin American centers of commerce and fun served by Braniff.

BRANIFF *International* **AIRWAYS**

Love Field • Dallas, Texas

PHENOMENAL PERFORMANCE OF THE NEW 54-TON LOCKHEED C-130A HERCULES, an Army Air Force freighter, is demonstrated in the photo above showing its first take-off at Marietta, Georgia. The big turbo-prop leaped off the runway in only 855 ft., or 9 times its own length. It is powered by four Allison-General Motors T-56-A-1 turbines driving Curtiss-Wright Turbolectric propellers. They develop 15,000 hp. A medium combat transport, the new Georgia-built Lockheed has 132-ft. span, 95-ft. length and a 38-ft. vertical fin. Its speed is said to exceed that of many World War II fighters. Chief Test Pilot Bud Martin commented: "It's the easiest flying airplane I've ever been in — I've never seen a cleaner airplane."
—(Lockheed Photo.)

York, where recently the entire home town paid him tribute.

Both friends and messages from friends poured in from all over, expressing with deep sincerity the high regard in which the Scintilla "Scintillator" is held by folks in aviation, especially the oldtimers who recognize better than anyone else, the yeoman service Tom Fagan and his co-workers have contributed over the years to aviation progress through making dependable equipment and then seeing to it that it worked properly.

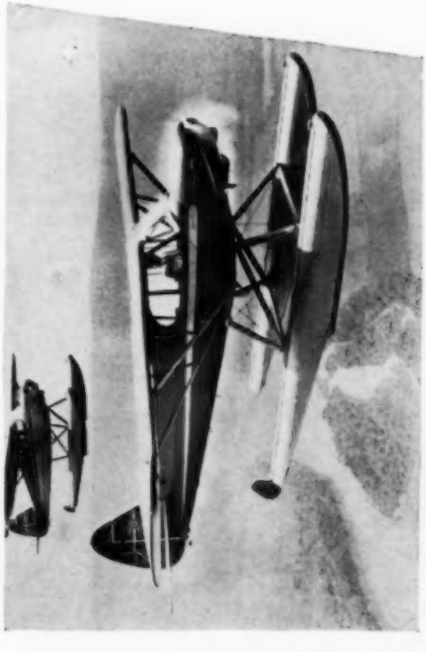
While it may never hit the headlines, every airman knows that aviation progress and safety are far more than just a good airplane with a good engine. Such a little item as a magneto or an ignition harness are as much a vital part to the machine as the heart or lung or stomach is to the human body.

We congratulate the town of Sidney for paying homage to a great but humble man. They know in the old home town what folks in aviation know — it has been the Tom Fagans in this business who made it great. And so long as we have a goodly number of Tom Fagans around, we don't have much to worry about. ★ ★ ★

this year FLY FLOATS

For sheer pleasure try floats this year. Reach remote fishing and hunting spots; cruise distant waterways. Land just about where you wish with your own plane on Edo floats. To see for yourself, why not visit your nearest seaplane operator and check out on floats?

EDO CORPORATION College Point, L. I., N. Y.



THERE IS A REASON WHY!

DALLAS AIRMOTIVE OVERHAULS MORE AIRCRAFT ENGINES THAN ANY OTHER COMPANY IN THE WORLD

DALLAS AIRMOTIVE INC.

6114 Forest Park Road, Dallas, Texas ELmhurst 3771

WIDEST SELLING
OMNI TODAY

narco
SUPERHOMER

More NARCO Superhomers are in use today in utility aircraft than any other make of Omni equipment. More NARCO Superhomers are installed as factory equipment in new aircraft than all other makes of Omni combined.

WHY? Because the NARCO Superhomer is the best low-cost Omni-navigation, VHF communication equipment available today.

This compact unit which is completely self-contained and fits into a standard glove compartment combines these great features:

OMNI

Accurate Omninavigation inbound and outbound for effortless navigation and easy position location. Combination to-from/left-right meter saves space, reduces cost with no compromise in quality.

VERNIER COURSE SELECTOR

Vernier control assures course selection to the exact degree.

4 CHANNEL TRANSMITTER

Permits distant VHF transmission to towers, range and Unicom stations.

VHF RECEIVER

Receives all VHF communications between 108 and 127 megacycles. Static free, crystal-clear.

For general utility flying the NARCO Superhomer provides everything you need—navigation and communications at lowest price. See your nearest NARCO dealer.

RELY ON
narco
NATIONAL AERONAUTICAL CORP.
AMBLER, PENNSYLVANIA

Questions and Answers for Operators

It's Spring at the Airport

The Tucson shindig is over and as far as we know everybody has recovered enough to know that the calendar says its spring all the way from San Francisco to Caribou, Maine, and from International Falls to Brownsville. There's no snow and that tall, well-stacked blonde in reservations has laid her supply of sweaters away for the summer. The spray-boys and the dusters have come out of hibernation and in a lot of places the spring elections are over, both assuring and dispelling worries among our airport manager friends.

We were taking it easy just a couple of days ago with an airport manager in his better-than-average office when the telephone woke up his day-dreaming secretary and she stuck her head around the door to say that the air conditioning had gone off in the coffee shop. It turned out to be some compressor trouble left over from last season. Nobody knew why it hadn't been repaired during the winter when no one needed air conditioning, but it reminded us of a maintenance superintendent we used to know. He was responsible for the condition of every piece of machinery, every device and every utility in a huge industrial plant. That meant that anything in the place designed to run had better be in shape to run on demand. He used a method and our airport manager used the same method because the two were friends. You might call it a check-list. Actually it was a schedule of things to be done.

We can recommend it to you as an essential. There are many things, both in the way of facilities and equipment, which must be available when needed or in the season during which they must be used.

Much of an airport's equipment is idle during part of the year and that is the best time to overhaul it and make sure it is in top shape. Take your mowers, for instance. When the last mowing is done in late summer or early fall, you can pull them under a shed and forget them or you can put them in the shop for a complete going over during the winter, using what might be idle time of the help, on those days that normal winter duty isn't heavy. By starting that work as early as possible, you can tell what parts are needed and get them in plenty of time. Try to do that when tall grass is just rustling to be cut.

Apply the same thinking to heating plants in the spring, and snow removal equipment and parking lot pavements and door checks. We don't know why it is but door checks seem to suffer disorders in the winter or maybe we just feel the rush of cold air then and know there is something wrong. Anyway, there are dozens of major and minor items on the seasonal and the continuing lists which must be inspected, maintained and repaired. So this check-list is nothing more than a list of all items and facilities on the airport which either need or may need attention. The way our friend used to make sure the job was done was like this:

On a table in the outer office there was a big yellow pad of columnar paper. On one side of the top sheet and several successive sheets was a list of the items to be inspected, overhauled or repaired. In the next column was the date by which the work had to be done. Next came the name of the employe who was responsible for seeing that it was done. The remaining columns were blank at the start but were really a progress chart. If parts were needed and not in stock, the date of order was shown. If delayed, that was indicated. Every employe who had any responsibility for any item on that list, and the airport manager himself, knew that sheet was

PRECISION . . .

In the Rebuilding of Aircraft Engines and Engine Accessories Is Essential to a Good Reputation. Our Customers Have Proven the Reliability of Engines and Accessories Rebuilt by . . .

PRECISION AEROMOTIVE
CORPORATION
MUNICIPAL AIRPORT — MI-lby-6636 — HOUSTON 17, TEXAS

ELIMINATION OF HAZARD of unmarked wires on runway approaches, a serious problem for years, is claimed for the use of orange-painted 20-in. aluminum spheres made by Mutto Manufacturing Co., Canton, Ohio, and installed at the Ada (Ohio) airport by the United Rural Electrical Co-op, Inc., Kenton, Ohio. Spheres weigh 4 lbs. each. Ohio Aviation Director C. E. A. Brown praised them as a boon to flying safety.

there and looked at it every day or so. No one could disclaim responsibility if the job wasn't done and the equipment ready when needed, not even the airport manager.

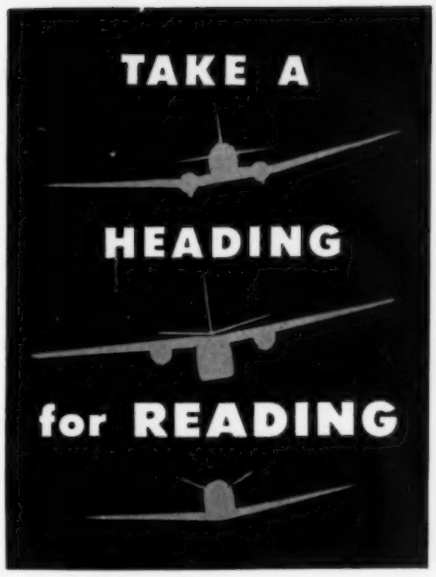
Maybe you think that's a lot of unnecessary work and red tape. Well, we remember an airport manager who usually needed three big pumps in the spring of the year because there was a nearby river which didn't know how to behave. He took someone's word for the condition of those pumps one day and only one turned out to be in working condition. No, the airport wasn't flooded but the manager sure got his feet wet.

Coin Phones for Unattended Airports

Our great "grampaw" used to tell us of a custom called "riding and tying" when two men had a long journey to make and only one piece of horseflesh between them. We ran into something that reminded us of that just the other Saturday. We were having coffee with a lad we knew some fifteen years ago when he was a student. He told us of an experience which probably isn't new to anybody but which leads us to wonder why more progress isn't being made to correct the situation which caused it.

At El Paso, he ran into an old friend of his who told him that he was on his way to Dallas as was this pilot, and was invited to ride. En route, they decided to stop over for the night in a small town to see the second man's father. They found the turf municipal airport with two T-hangars and two aircraft tied down. They tied down, too. Then they tried to get into town about three miles away.

There was no one around the air-



To The
SIXTH
ANNUAL
MAINTENANCE
and
OPERATIONS
MEETING
SATURDAY
JUNE 4, 1955
and the
READING
AVIATION AWARDS
For Furtherance of
High Standards
Of Excellence In
INDUSTRIAL, EXECUTIVE
and PRIVATE AIRCRAFT

RAS INCORPORATED

READING
AVIATION SERVICE, INC
Municipal Airport • Reading, Pa.

It's "Plane to Sea" the constant-speed MET-L-MATIC propeller by McCauley is RIGHT OUT FRONT!

• You fly with CONFIDENCE behind a Met-L-Matic propeller

MET-L-MATIC FORGED STRENGTH

McCAULEY INDUSTRIAL CORPORATION
1640 HOWELL AVE.
DAYTON 7, OHIO

"World's largest maker of metal propellers for personal and business aircraft . . . more than 40,000 Met-L-Props, and now the new Met-L-Matic."

In the Southwest It's Dallas Aero Service

- AIRCRAFT
- ENGINES
- ACCESSORIES
- INSTRUMENTS
- RADIO
- CONVERSION
- MODIFICATION
- OVERHAUL
- REPAIR
- TANK SEALING
- SERVICING
- STORAGE
- ENGINEERING

AIRCRAFT SALES AND CUSTOM INTERIORS

"Guaranteed Quality"

DALLAS AERO SERVICE

PHONE DI-8141 · 3300 LOVE FIELD DRIVE · DALLAS 9, TEXAS

port, which wasn't surprising considering the size of the town. There was no telephone nor was there any kind of a ranch dwelling nearby. So they hoofed it out to the main highway about a half-mile over a gravel road, each lugging his small bag. On the highway they tried to hitch a ride and got the brush by all the better cars. Finally a truck stopped for them and took them into town. By actual time it took them almost an hour and they had walked half way into town before the truck overtook them.

A telephone at an airport which is unattended will solve the problem for those who fly in. This column has expressed that opinion many times before. A telephone is the most essential piece of airport equipment.

However, the interesting comment of our friend that caused us to open up on this subject again was this: he conjectured that a nickel pay phone out at the airport probably wouldn't pay for the service, but he thought maybe they should have a telephone which took quarters. He said he'd have been glad to pay a quarter. Corn plasters cost thirty cents.

Maps for Airport Zoning

City officials tell us that one of the major problems involved in airport zoning occurs when property owners ask the permissable height of structures on individual pieces of real estate. That stems from the two major variables involved — the elevation of the property owner's real estate as it compares with the elevation of the airport zoned, and permissible elevation of structures in the approaches and turning zones as stipulated in the zoning statutes.

Stated simply, the problem might be this: this airport elevation is 500 feet above sea level; the property owner's real estate is at a distance from the airport where structures may extend upward to a height of 80 feet above the level of the airport; the height permissible on that land would then depend on the elevation of the property owner's real estate. If that had an elevation above sea level of 540 feet, then the property owner could erect a structure forty feet in height without exceeding the zoned elevation; that is, airport elevation (500 feet) plus zoned height limit (80 feet) minus elevation of property owner's lot (540 feet) equals 40 feet.

On the other hand, if the property owner's lot had an elevation of 480 feet above sea level, a structure 100 feet in height would not violate the zoning ordinance. Few people know the elevation of property they own and many have a difficult time understanding zoning maps. The whole thing can be very confusing.

But last month while we were in George Coker's office at Love Field, Dallas, Texas, he showed us something that is a mighty slick solution to such confusion. For city offices where inquiry may be made there has been prepared a series of drawings which make it only a matter of minutes to discover the height limitations on any piece of property within the zoned area.

First there is a map of the city and environs with the zoned approaches, turning zones and all the zoned area superimposed on it. The map is divided into rectangles over the whole area zoned. Each of these rectangles is numbered.

Any property owner seeking information regarding his property has only to determine from the master drawing which numbered rectangle his property is in. Then he may turn to the drawing included in the set which bears that number. He will find this is a map showing the property in that rectangle. It is a contour map of that area and the contour lines show the elevation above sea level. Superimposed on the map are lines showing the various elevations above sea level of permissible structures. In the approaches these slope upward as distance from the airport increases. As we recall the maps, the lines shown show each five-foot increase in permissible height.

The property owner has only to locate his property on the map. ★ ★ ★

NEW, COMPACT Scott OXYGEN CONSOLE

Complete, fixed oxygen system for business aircraft.

$300*

*Average cost of complete system including installation.

Write today for more information. Give make of aircraft.

Scott — FOR SAFETY - FOR SERVICE — SINCE 1937

SCOTT AVIATION CORP.
235 Erie Street, Lancaster, N. Y.
Export: Southern Oxygen Co.
15 West 57th Street, New York 19, N. Y.

A Few Reasons Why AEROTRON Is A Leader In Its Field . . . .

. . . . Area distributors for Collins, Flite-tronics, Narco.
. . . . Approved radio repair station (No. 3668) Class I and 2.
. . . . Full insurance for aircraft in our hangar.
. . . . Hangar space sufficient for DC-3 equipment.
. . . . Specialists in custom radio installations.
. . . . FCC and CAA licensed technicians.
. . . . Complete radio overhaul and repair facilities.

ARC

Hangar 12
P. O. Box 8442

AEROTRON RADIO CO.
Tulsa, Oklahoma
Municipal Airport

COLLINS

Telephone
8-1507

RECORD PERFORMER

(Continued from page 23)

A supercharged Continental FSO-470-A engine powers the CH-1, rated at 260 hp. to the transmission at 3,000 rpm. from sea level to 10,000 ft. Pioneering gear work is featured in the Cessna. Its main transmission uses only 3 gears, of a heavy-duty type similar to that used in bulldozers and earth moving machines.

Rotor blade attachment is a radical new development using stacked layers of sheet metal, sandwich fashion, for the blade attachment members. These flex to absorb twists and movements but require no maintenance.

No marketing plans or pricing have been given by Cessna, which is expected to go after military orders for the high-performance CH-1 and eventually to enter it on the steadily-expanding commercial helicopter market. The CH-1 first flew in July, 1954. ★ ★ ★

"Margaret Callaway, internationally known aviatrix, has selected Dal-Tex Aviation of Dallas, Texas, to groom her plane for the coming Women's Trans-Continental Air Race on July 2nd, from Long Beach, California, to Springfield, Massachusetts.

Mrs. Callaway, of Carswell Air Force Base, Ft. Worth, Texas, has selected, the Dallas firm and Mr. T. O. Wright, maintenance supervisor, to personally prepare her Cessna 140. Mrs. Callaway is an experienced race pilot, having flown the speed dash three times previously. The race is sponsored by the 99's, international organization of licensed women pilots." (Adv.)

CAA SAFETY

(Continued from page 25)

a framework of broad national governmental policy. You, as a committee member, have a rare opportunity to contribute to the orderly evolution of the aviation safety program in its relation to a civil aviation industry that has come of age."

In notifying aviation industry organizations of the committee's assignment, Koch predicted that the formal "industry-government collaboration phase" will be reached shortly after July 1.

The work of the Office of Aviation Safety which the committee is reviewing falls into the broad categories indicated by its four divisions.

The air carrier division is responsible for inspection of the operating and maintenance practices of the scheduled airlines and the large irregulars.

The general operations division conducts safety inspections and programs among the owners of the more than 50,000 smaller aircraft used for executive transportation, agricultural purposes, and personal transportation. It is concerned, too, with licensing airmen.

The aircraft engineering division determines whether aircraft meet minimum safety requirements before they are sold to the public or to the airlines, and issues directives as necessary to maintain the planes in airworthy condition.

The medical division supervises medical examinations for airmen, and does research in the field of aviation medicine. ★ ★ ★

THE POPULAR NEW YORK ADDRESS...

HOME OF THE FAMOUS

Hawaiian Room

Hotel Lexington

CHARLES E. ROCHESTER, President

George W. Miller, Manager

LEXINGTON AVE. at 48th ST.

NEW YORK 17, N.Y.

CA-20

cabin audio amplifier

20 watt output boosts cabin speaker efficiency to a new top performance, even in high noise level aircraft. For any aircraft electrical system. Standard mounting dimensions — integral mike circuit for PA system — best for all executive, airline and military transports.

for details and prices write:

FLITE-TRONICS, INC.

3303-A Burton Avenue

Burbank, California

Pat. Pending

SERVICE GUIDE FOR FLIERS —

WHERE to STOP

IN SAN ANTONIO . . .
IT'S ALAMO
AIR LINE
SERVICES

On San Antonio Municipal Airport transient pilots who want the best in prompt and efficient service always stop with Alamo Air Line Services, Inc.

Texaco Products — Storage — Tie-Down

Next time you're down our way, drop in!

Free transportation to and from Terminal Bldg.

24-Hour Charter Service Telephone Travis 2649

Flying's Swell at the FLYING L

An adventure in real Western life for all the family . . . Superb food . . . Your favorite ranch sports . . . Cozy-comfort guest suites. Located at Bandera, 48 miles West of San Antonio.

WHAT ?? WHERE HOW MUCH $

WE'RE BUYING

Used airplanes; any make, any model, any size. Call, write, wire or see Skinny Crouch for a free appraisal of your airplane.

Highest Cash Prices

BEN GRIFFIN AVIATION CO.
Dealer for Piper Aircraft
Highland Park Airport Office
Dallas, Texas, Phone EM-5193

Celanese Corporation
has switched its
Lodestar Engine Overhauls
to
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

IN DALLAS IT'S

Dal-Tex Aviation Inc. Cessna Lear NARCO

World's Largest Cessna Dealer
HIGHLAND PARK & LOVE FIELD

NAVCO INC.
Lambert Field
St. Louis, Mo.
TErryhill 5-1511

Has all Parts and Supplies for Executive DC-3 LODESTAR BEECH

Airframe Engines Radios
A.R.C. Bendix Collins Lear Sperry Wilcox
P&W Continental Wright Goodrich Goodyear

Executive Aircraft
Complete Services and Sales
DC-3 Lodestar D18S

Inc., of ST. LOUIS **REMMERT-WERNER** Inc., of TOLEDO

REMMERT-WERNER, Inc.
Lambert Field St. Louis, Mo.

Offers Your Choice of

1 DAY 100-hour INSPECTIONS	2 DAY or for	3 DAY 100-hour OVERHAULS
BEECHCRAFT	DC-3	LODESTAR

AIRCRAFT FINANCING

Dealers and Operators, Inquire About Our New Low Rates.
Dealer Floor Planning
Aircraft Finance, Inc.
Skyranch Airport, Box 5306
Denver 17, Colo.

ENGINE WORKS
Lambert Field Inc. St. Louis

Largest supplier of engines for executive DC-3. We stock, overhaul, and install—

SUPER-92

Wright	Pratt & Whitney
R1820	**R1830**
-202 -56 -72	-75 -92 -94

Also R2000-D5, -13 R1340 R985

DC-3 Owners—write for our DC-3 engine evaluation form, and engine exchange plan.

GRUMMAN SUPER WIDGEON
by McKinnon-Hickman

Take-off 700' land, 10 seconds water—Cruise 160 mph. on 65% power—True Single Engine Operation — Comfortable — Versatile — Economical. Immediate Delivery.
Kits also available or we will convert your Widgeon at Portland, Oregon or at New York in one month's time.
Write for Brochure.

WELSCH AVIATION CO.
60 East 42nd Street, Suite 729
New York 17, New York Murray Hill 7-5884

ENGINE WORKS
Lambert Field St. Louis, Mo.
Furnishes engines and overhauls to:

Grumman Aircraft	Coca-Cola
Northrop Aircraft	Falstaff
International Harvester	T. V. A.
Budweiser	Monsanto
U. S. Engineers	Mather Iron

and over 100 other business DC-3, D18S, Lodestars R1830-92, -75, -94, SUPER-92, R985, R1820.

BONANZAS
For Top Quality Bonanzas
VISIT — CALL — WRITE
B. D. "BUN" DEWEESE
J. R. GRAY COMPANY, INC.
Beechcraft Distributors
Love Field — Dallas, Texas
Office EL-3245 Home JU-8664
GUARANTEED

Air Reduction Company
is now using
DC-3 Engine Overhauls
by
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

EXECUTIVE TRANSPORT AIRCRAFT

DOUGLAS, LOCKHEED, BEECH, GRUMMAN, and CURTISS aircraft for sale. For top value executive aircraft call or write ATLANTIC AVIATION CORP., P. O. Box 146, Hasbrouck Heights, New Jersey. HA8-1740. Complete aircraft maintenance facilities at Teterboro, New Jersey, and Logan Airport, Boston.

We Buy DC-3 and C-47

— also components, fuselages, center sections. Prefer runout or needing work, airline, passenger, or cargo, Pratt & Whitney or Wright. State price, time, quantity, type engines.

We are not brokers

Remmert-Werner, Lambert Field St. Louis, Mo.

SUPER-92
over 200 mph for your DC-3
CAA Approved—better single engine—lower costs
Fully interchangeable with —92
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

International Harvester
and
Great Lakes Carbon
have switched their R1830 overhauls to
ENGINE WORKS
Lambert Field INC. St. Louis, Mo.

Ford Motor Company of Canada
has switched
DC-3 Engine Overhauls
to
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

WE SELL
BUY • LEASE • TRADE • FINANCE
MULTI-ENGINE AIRCRAFT
WE OWN THE AIRCRAFT WE OFFER
Wire or Write
L. B. Smith
AIRCRAFT CORPORATION
DEPT. FL-3 • P.O.BOX 456, MIAMI 48, FLA.

AIRPLANES WANTED!

Need 50 Bonanzas, 195's, 190's, 180's, 170's, Tri-Pacers, Twin Navions, Aero Commanders, Twin Bonanzas, etc. Pay highest wholesale prices. We'll buy one or complete dealers' stocks, new or used.

VEST AIRCRAFT CO'S. SKYRANCH
Box 5306, Denver 17, Colo.

AIRPLANES WHOLESALE

Send for Free Weekly Lists
Planes Supplied to Dealers on Low-Cost Floor Plan.
We'll Finance Your Sales!
Vest Aircraft Co's. Skyranch
Box 5306, Denver 17, Colo.

Great Southern Trucking Company
is now using
Lodestar Engine Overhauls
by
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

Goodyear Aircraft
has switched
DC-3 and Bonanza Engine Overhauls
to
ENGINE WORKS
Lambert Field Inc. St. Louis, Mo.

MATS SERVICE TEST PROGRAM BOOSTS TURBO-PROP POWER

FIRST Turbo-Prop powered aircraft delivered to a U.S.A.F. operating unit are rapidly accumulating time and experience with the Military Air Transport Service. Assigned to the newly established 1700th Test Squadron at Kelly AFB two Convair YC-131C airplanes spend hours in the air over San Antonio, Texas and en route to MATS bases on east and west coasts.

The twin-engined aircraft are powered by Allison YT56 Turbo-Prop engines and Aeroproducts propellers.

With flight records of 10½ hours on one aircraft in a single day, the crack pilots and ground crews of the 1700th are rapidly becoming aviation's most enthusiastic boosters for Turbo-Prop power.

This Air Force flight testing carries forward a Turbo-Prop flight test and evaluation program begun almost five years ago when Allison began flying another Convair passenger-type airplane powered by earlier model T38 engines. This airplane has also been used extensively for demonstration purposes and has made more than 600 flights, carrying approximately 3600 passengers.

To date, Allison Turbo-Prop engines have powered in flight 21 aircraft of 9 different types—all independent of any other power. This is more experience with Turbo-Props than the total for all other U.S. Turbo-Prop engines.

It is superb background for introduction to commercial service of the new Allison Model 501 Turbo-Prop engine. The T56, its military counterpart, will have accumulated two years of production and operating experience prior to commercial availability for regularly scheduled passenger service.

These new Allison Turbo-Props, for both military and commercial use, reflect the knowledge Allison has gained in designing and building gas turbine engines that have flown more than five-and-one-half million hours. These engines are daily flying the equivalent of one hundred trips around the world—*experience where it counts most—in the air.*

ALLISON DIVISION OF GENERAL MOTORS — Indianapolis, Indiana

GM AIRCRAFT POWER

Allison TURBO-PROP ENGINES

AMERICAN BUILT FOR THE NEW ERA IN AIR TRAVEL

TCA and TEXACO ...prove a great additive-type oil

TRANS-CANADA AIR LINES serves more than 50 points in Canada and the United States—Britain, France, Germany, British West Indies, Bahamas, Bermuda and Mexico. *Texaco Aircraft Engine Oil ED (Extra Duty)* used on all TCA North Stars, DC-3s and Bristol Freighters is supplied by McColl-Frontenac Oil Company, Limited, Montreal, distributor of Texaco Products in Canada.

IN OVER 200,000 engine hours of oil evaluation on Trans-Canada Air Lines' North Stars, DC-3s and Bristol Freighters, the new and improved *Texaco Aircraft Engine Oil ED (Extra Duty)* has proved the finest aircraft engine lubricant yet developed.

Texaco Aircraft Engine Oil ED (Extra Duty) is an additive-type oil that reduces engine deposits and permits safe extension of overhaul periods. It prolongs the life of engine parts and is a big factor in keeping maintenance costs low.

That the first additive-type aircraft engine oil in commercial use today should come from Texaco is only logical. In this field, Texaco has paced the industry for years. In fact,

For over 20 years, more scheduled revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with any other brand.

Let a Texaco Aviation Representative give you the full story on *Texaco Aircraft Engine Oil ED (Extra Duty)*. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, *Aviation Division*, 135 East 42nd Street, New York 17, New York.

TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

TUNE IN . . . TEXACO STAR THEATER starring DONALD O'CONNOR or JIMMY DURANTE on television . . . Saturday nights, NBC.